

San Dieguito  
**Water**  
**District**

**Financial Plan, Cost of Service, and  
Water & Recycled Water Rate Study**

Final Report / July 30, 2021





July 26, 2021

Mr. Isam Hireish  
Interim General Manager  
San Dieguito Water District  
160 Calle Magdalena  
Encinitas, CA 92024

**Subject: Water and Recycled Water Financial Plan Study Report**

Dear Mr. Hireish,

Raftelis is pleased to provide this 2022 Water and Recycled Water Rate Study Report (Report) for the San Dieguito Water District (District). This Report includes an updated five-year financial plan for fiscal year (FY) 2022 to FY 2026. The District is setting water rates for FY 2022, FY 2023, and FY 2024.

The Study objectives include the following:

1. Update the District's five-year financial plan to ensure financial sufficiency, meet operation and maintenance (O&M) costs, and ensure funding to meet debt obligations and fund necessary capital expenditures;
2. Conduct a current water cost-of-service that complies with Prop 218;
3. Calculate updated water and recycled water rates for FY 2022, FY 2023, and FY 2024;
4. Update drought rates to ensure collection of sufficient revenue during periods of reduced water demand due to potential drought or other water shortage emergencies; and
5. Conduct a customer impact analysis for the proposed rates.

It has been a pleasure working with you, Mary Kazungu, Blair Knoll, and other District staff during this Study.

Sincerely,

A handwritten signature in blue ink that reads 'Steve Gagnon'.

**Steve Gagnon, PE (AZ)**  
Senior Manager

A handwritten signature in blue ink that reads 'Jonathan Jordan'.

**Jonathan Jordan**  
Staff Consultant

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# 1. Executive Summary

The District strives to conduct water rate studies every two or three years because its water purchase costs can vary significantly from year to year based on local water availability. The District's local surface water is more economical than purchased imported water from the SDCWA. Water from Lake Hodges Dam is the least expensive District water source<sup>1</sup>. Currently, Lake Hodges is operating at reduced capacity under restrictions imposed by the California Department of Water Resources - Division of Safety of Dams. The District, Santa Fe Irrigation District, and the City of San Diego are preparing to participate in a large-scale Capital Project to conduct short and long-term repairs to the Lake Hodges dam. This capital project will be jointly funded and a primary driver of District capital project costs in future years.

The District conducted this water rate study to ensure that water rates and charges are sufficient to meet enterprise revenue requirements. Additionally, the District would like to minimize rate increases and large fluctuations to mitigate potential impacts on the ratepayers after the COVID-19 pandemic that began in spring 2020. The last Study (which the Board approved) recommended revenue increases of 6.5% on May 1, 2019 and May 1, 2020.

In the Fall of 2020, the San Dieguito Water District engaged Raftelis to conduct a Water Rate Study (Study) consisting of a financial plan update, cost of service, and three years of rate adjustments for fiscal year (FY) 2022 through FY 2024. This Report presents the financial plan, Cost of Service, and the resulting rates for implementation on January 1, 2022, January 1, 2023, and January 1, 2024.

## 1.1. Methodology

Raftelis and the District developed rates using Cost of Service (COS) principles set forth by the American Water Works Association M1 Manual titled *Principles of Water Rates, Fees and Charges* (AWWA M1 Manual). COS principles endeavor to distribute costs to customer classes in proportion to the way each class uses the water system.

Performing a COS study provides the rate basis to meet Proposition 218 requirements – that rates must be based on costs. It is common to set rates for several years before revisiting the COS to minimize customer rate and bill fluctuations. This Study uses the AWWA Base-Extra Capacity Method to distribute costs to customer classes and tiers. This method separates costs into four main cost causation components: base costs, extra capacity costs, customer costs, and fire protection costs. Base costs are associated with meeting average daily demand needs and include operations and maintenance costs and capital costs designed to meet average load conditions. Extra capacity costs are costs (both operating and capital costs) associated with meeting peak demand. Customer costs are costs associated with serving customers, such as meter reading, billing and customer service, etc. Direct fire protection costs are related solely to the fire protection function, such as fire hydrants, fire connections, and related mains and valves.

## 1.2. Proposed Financial Plan and Revenue Adjustments

The financial planning model enables the District to set rates and charges to generate enough water revenue to meet the District's short-term and long-term obligations and avoid significant rate fluctuations. It shows the revenues that will maintain appropriate reserves and provide adequate debt service coverage while maintaining a sensitivity to ratepayers rate increases.

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<sup>1</sup> Lake Hodges water is referred to as local raw water in this report.

Table 1-1 shows the proposed revenue adjustments and CIP accomplishment rate selected by the Board of Directors at the June 16, 2021 Board Meeting. The proposed financial plan implements a gradual increase of revenue adjustments on January 1 for each year. To enable these revenue adjustments, the Capital Accomplishment decreased in FY 2023-2024. This proposed scenario allows the District to maintain reserves and mitigate impacts that ratepayers see to their bill directly. Revenue adjustments are shown outside the rate-setting period (FY 2025 & FY 2026) *for planning purposes only* and are subject to the District Board’s approval in future years. The blue box shows the revenue adjustments that the District will implement for the next three years.

**Table 1-1: Proposed Revenue Adjustments and Capital Accomplishment Rate**

Fiscal Year	Proposed Revenue Adjustments	Proposed CIP Accomplishment
2022	5.5%	100%
2023	6.0%	75%
2024	6.5%	75%
2025	5.0%	75%
2026	5.0%	75%

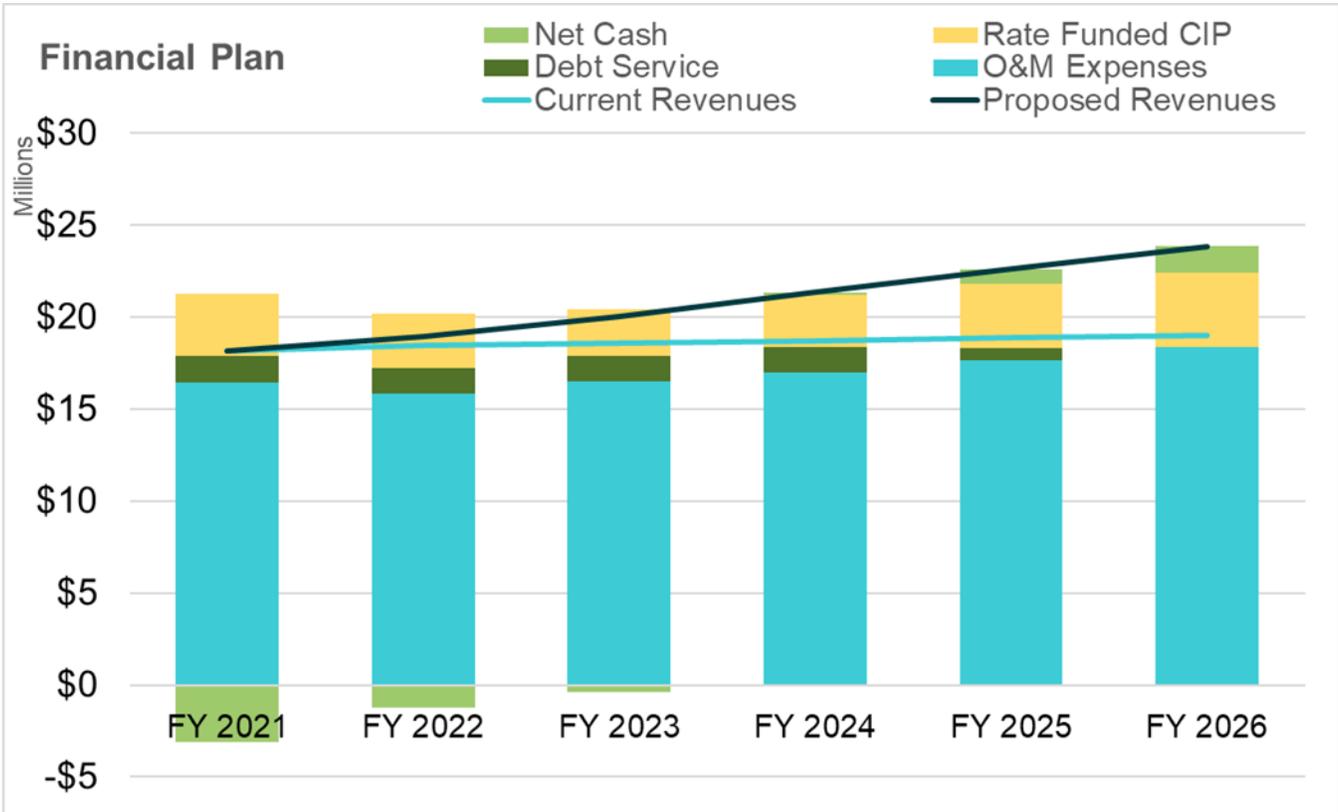
Table 1-2 shows the proposed financial plan incorporating the proposed revenue adjustments and CIP accomplishment rate. Line 1 shows revenue from current rates, assuming no increase in rates. Rate revenue from current rates includes water, recycled water, and private fire customers and consumption, where applicable. Line 2 shows the additional revenue received from the revenue adjustments proposed in Table 1-1. Lines 3 - 6 shows non-rate revenues. Interest revenues (Line 6) decrease in FY 2024 due to declining reserve balances caused by the negative net cash flow (Line 21). Line 7 shows all projected revenues, including rate revenue, non-rate revenue, and interest revenue. Lines 10 – 15 summarizes the O&M expense projections. Line 16 shows the existing debt service. Line 18 shows the CIP Expenditures adjusted for the reduced accomplishment proposed in Table 1-1. Total expenses, including O&M, debt service, and rate-funded capital, are shown in Line 19. Line 21 shows a negative net cash flow FY 2021 through FY 2023, largely due to the planned expenditures in capital facilities during those years. The debt coverage ratio is projected to exceed the target debt coverage ratio throughout the study period. The proposed financial plan ensures financial sufficiency and solvency for the District to meet projected expenditures and financial obligations, including debt service, debt coverage, and most reserve targets while funding CIP projects at a reduced capacity.

**Table 1-2: Proposed Financial Plan Cashflow**

Line No.	Cash Flow	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	<b>Revenue from Rates</b>	\$16,191,174	\$16,591,869	\$16,714,270	\$16,837,854	\$16,962,635	\$17,088,623
2	Additional Revenue from Revenue Adjustments	\$0	\$456,276	\$1,448,291	\$2,603,886	\$3,744,743	\$4,815,616
3	Misc Operating Revenue	\$497,624	\$505,517	\$513,612	\$521,914	\$530,430	\$539,165
4	Property Taxes	\$1,081,600	\$1,081,600	\$1,081,600	\$1,081,600	\$1,081,600	\$1,081,600
5	Capital Revenue	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
6	Interest Revenue (Pooled Investment Earnings)	\$293,201	\$206,294	\$190,034	\$187,119	\$196,134	\$218,394
7	<b>Total Revenue</b>	<b>\$18,163,599</b>	<b>\$18,941,557</b>	<b>\$20,047,807</b>	<b>\$21,332,373</b>	<b>\$22,615,542</b>	<b>\$23,843,398</b>
8							
9	<b>Expenses</b>						
10	Administration	\$2,649,493	\$2,703,241	\$2,758,657	\$2,815,796	\$2,874,712	\$2,935,461
11	Customer Service	\$898,472	\$925,651	\$953,664	\$982,535	\$1,012,293	\$1,042,963
12	Water Purchases and Treatment	\$9,173,392	\$8,417,298	\$8,868,243	\$9,159,364	\$9,605,966	\$10,077,456
13	Recycled Water Program	\$876,339	\$810,785	\$842,126	\$875,809	\$910,857	\$947,328
14	Field Operations	\$2,341,895	\$2,415,798	\$2,492,076	\$2,570,809	\$2,652,076	\$2,735,962
15	Planning and Engineering	\$530,613	\$547,138	\$564,186	\$581,775	\$599,922	\$618,646
16	Existing Debt Service	\$1,401,766	\$1,402,497	\$1,405,744	\$1,406,016	\$633,950	\$0
17	Proposed Debt Service	\$0	\$0	\$0	\$0	\$0	\$0
18	Rate Funded CIP	\$3,399,527	\$2,966,400	\$2,558,095	\$2,839,724	\$3,515,808	\$4,047,316
19	<b>Total - Expenses</b>	<b>\$21,271,497</b>	<b>\$20,188,807</b>	<b>\$20,442,790</b>	<b>\$21,231,828</b>	<b>\$21,805,585</b>	<b>\$22,405,131</b>
20							
21	<b>Net Cash Flow</b>	<b>-\$3,107,897</b>	<b>-\$1,247,250</b>	<b>-\$394,983</b>	<b>\$100,545</b>	<b>\$809,957</b>	<b>\$1,438,267</b>
22	Debt Service Coverage	121%	223%	254%	309%	782%	
	Target Coverage	115%	115%	115%	115%	115%	115%

Figure 1-1 graphically illustrates the operating Financial Plan – it compares existing (current) and proposed revenues with projected expenses. The stacked bars show expenses, including O&M expenses, debt service, and rate-funded CIP. Total revenues at existing and proposed rates are shown by horizontal light blue and dark blue lines. Current revenue from existing rates, in light blue, does not meet future total expenses and shows the need for revenue adjustments.

Figure 1-1: Proposed Financial Plan



## 1.3. Proposed Three-Year Rates

### 1.3.1. FIXED POTABLE BI-MONTHLY SERVICE CHARGES

Table 1-3 shows the proposed bi-monthly service charge. Table 1-4 shows the proposed fire service charges. FY 2022 charges shown incorporate the revenue adjustments shown in Table 1-1. However, the charges for FY 2022 are set using the cost of service analysis and do not equate to increasing the current rates by the revenue adjustment. The cost of service analysis is detailed in Section 5 and Section 6. Charges for FY 2023 and FY 2024 can be calculated by increasing FY 2022 rates by the proposed revenue adjustments. The proposed fire service charges apply to all customers with private fire service connections. The rates for the current and proposed bi-monthly service charges and fire service charges are calculated based on the meter size and diameter of the fire line serving a property, respectively. The proposed rates are rounded to the nearest cent.

**Table 1-3: Proposed Bi-Monthly Service Charges**

Meter Size	FY 2021 Current	FY 2022 Proposed	FY 2023 Proposed	FY 2024 Proposed
5/8"	\$45.16	\$46.75	\$49.56	\$52.78
3/4"	\$45.16	\$46.75	\$49.56	\$52.78
1"	\$66.50	\$69.15	\$73.30	\$78.06
1.5"	\$119.37	\$124.65	\$132.13	\$140.72
2"	\$183.06	\$191.52	\$203.01	\$216.21
3"	\$331.78	\$347.66	\$368.52	\$392.47
4"	\$544.61	\$570.67	\$604.91	\$644.23
6"	\$1,074.78	\$1,127.69	\$1,195.35	\$1,273.05
8"	\$1,711.73	\$1,796.38	\$1,904.16	\$2,027.93

**Table 1-4: Proposed Fire Service Charges**

Meter Size/Line Diameter	FY 2021 Current	FY 2022 Proposed	FY 2023 Proposed	FY 2024 Proposed
1"	\$9.61	\$9.81	\$10.40	\$11.08
1.5"	\$10.83	\$8.74	\$9.26	\$9.86
2"	\$18.88	\$15.15	\$16.06	\$17.10
3"	\$47.77	\$38.15	\$40.44	\$43.07
4"	\$97.59	\$77.81	\$82.48	\$87.84
6"	\$276.40	\$220.17	\$233.38	\$248.55
8"	\$584.82	\$465.72	\$493.66	\$525.75

### 1.3.2. PROPOSED POTABLE COMMODITY RATES

Table 1-5 shows commodity rates for the next three years. FY 2022 charges shown incorporate the revenue adjustments shown in Table 1-1. However, the rates for FY 2022 are set using the cost of service analysis and do not equate to increasing the current rates by the revenue adjustment. The cost of service analysis is detailed in Section 5 and Section 6. Charges for FY 2023 and FY 2024 can be calculated by increasing FY 2022 rates by the proposed revenue adjustments. Commodity rates are charged for each unit (HCF) of water. All rates are rounded to the cent.

**Table 1-5: Proposed Commodity Rates by Class/Tier**

Class/Tier	Tier Breakpoint	FY 2021	FY 2022	FY 2023	FY 2024
		Current	Proposed	Proposed	Proposed
<b>Single Family Residence</b>					
Tier 1	12	\$3.19	\$3.26	\$3.46	\$3.68
Tier 2	20	\$5.06	\$5.86	\$6.21	\$6.61
Tier 3	40	\$6.25	\$6.61	\$7.01	\$7.47
Tier 4	>40	\$7.12	\$7.86	\$8.33	\$8.87
<b>Single Family - Agriculture</b>					
Tier 1	12	\$3.19	\$3.26	\$3.46	\$3.68
Tier 2	20	\$5.06	\$5.86	\$6.21	\$6.61
Tier 3	40	\$6.25	\$6.61	\$7.01	\$7.47
Tier 4	>40	\$6.25	\$6.95	\$7.37	\$7.85
<b>Single Family - Commercial</b>					
Tier 1	12	\$3.19	\$3.26	\$3.46	\$3.68
Tier 2	20	\$5.06	\$5.86	\$6.21	\$6.61
Tier 3	40	\$6.25	\$6.61	\$7.01	\$7.47
Tier 4	>40	\$6.25	\$6.95	\$7.37	\$7.85
<b>Multi-family</b>					
Tier 1	8	\$3.19	\$3.26	\$3.46	\$3.68
Tier 2	12	\$5.06	\$5.86	\$6.21	\$6.61
Tier 3	16	\$6.25	\$6.61	\$7.01	\$7.47
Tier 4	>16	\$7.12	\$7.86	\$8.33	\$8.87
<b>Multi-family - Agriculture</b>					
Tier 1	8	\$3.19	\$3.26	\$3.46	\$3.68
Tier 2	12	\$5.06	\$5.86	\$6.21	\$6.61
Tier 3	16	\$6.25	\$6.61	\$7.01	\$7.47
Tier 4	>16	\$6.25	\$6.95	\$7.37	\$7.85
<b>Multi-family - Commercial</b>					
Tier 1	8	\$3.19	\$3.26	\$3.46	\$3.68
Tier 2	12	\$5.06	\$5.86	\$6.21	\$6.61
Tier 3	16	\$6.25	\$6.61	\$7.01	\$7.47
Tier 4	>16	\$6.25	\$6.95	\$7.37	\$7.85
<b>Commercial/AG</b>	Uniform	\$5.42	\$5.61	\$5.95	\$6.34
<b>Institutional</b>	Uniform	\$5.93	\$6.19	\$6.56	\$6.99
<b>Landscaping</b>	Uniform	\$6.25	\$6.49	\$6.88	\$7.33
<b>Construction</b>	Uniform	\$6.36	\$6.62	\$7.02	\$7.48

### 1.3.3. PROPOSED RECYCLED WATER RATES AND CHARGES

Table 1-6 shows recycled water charges rates for the next three years. Recycled water customers are billed monthly. The fixed charge is set to be half the potable bi-monthly fixed charge and is based on the meter size serving the customer. The bottom half of the table shows the commodity rate per HCF. All rates are rounded to the cent.

**Table 1-6: Proposed Recycled Water Rates**

	FY 2021 Current	FY 2022 Proposed	FY 2023 Proposed	FY 2024 Proposed
<b>Fixed Meter Charges</b>				
<b>Meter Size</b>				
5/8"	\$22.58	\$23.38	\$24.78	\$26.39
3/4"	\$22.58	\$23.38	\$24.78	\$26.39
1"	\$33.25	\$34.58	\$36.65	\$39.03
1.5"	\$59.69	\$62.33	\$66.07	\$70.36
2"	\$91.53	\$95.76	\$101.51	\$108.11
3"	\$165.89	\$173.83	\$184.26	\$196.24
4"	\$272.31	\$285.34	\$302.46	\$322.12
6"	\$537.39	\$563.85	\$597.68	\$636.53
<b>Commodity Rates (\$/HCF)</b>				
<b>Customer Class</b>				
Agriculture	\$4.34	\$5.39	\$5.71	\$6.08
Commercial	\$4.34	\$5.39	\$5.71	\$6.08
Public	\$4.74	\$5.39	\$5.71	\$6.08
Government	\$4.74	\$5.39	\$5.71	\$6.08
Landscaping	\$5.00	\$5.39	\$5.71	\$6.08
Construction	\$5.09	\$5.39	\$5.71	\$6.08

### 1.3.4. DROUGHT RATES

Drought rates were updated using the existing methodology and are assessed per unit (HCF) of water. The percent reduction in water demand during each water shortage emergency stage is defined in the District’s Water Shortage Contingency Plan, approved by the Board as a part of the 2020 Urban Water Management Plan and Municipal Code.

Table 1-7 shows the derivation of the proposed drought rates. Net revenue loss (Line 3) in each stage is determined by subtracting the projected water purchase cost savings from the projected lost revenue. The percentage increase required to collect lost revenues is determined by dividing the net revenue loss at each stage by the corresponding projected water sales in HCF. Drought rates recover the anticipated reduction in net revenues during each water shortage emergency stage by applying the percentage increase (Line 6) to commodity rates to recoup the lost revenue. The percentage increase needed for each drought stage is calculated by dividing the net lost revenue (Line 3) by the expected drought revenue (Line 4). This percentage increase is applied to the proposed commodity (Table 1-5) rates to yield the drought rates.

**Table 1-7: Drought Rate Calculation**

Line No.	Declared Water Supply Shortage Response	Declared Water Supply Shortage Response					
		1 Up to 10%	2 Up to 20%	3 Up to 30%	4 Up to 40%	5 Up to 50%	6 Up to 60%
1	Estimated Lost Revenue	\$1,577,371	\$3,133,122	\$4,711,875	\$6,070,090	\$7,228,384	\$8,502,732
2	Estimated Drought Savings	\$717,749	\$1,428,820	\$2,133,284	\$2,847,791	\$3,595,624	\$4,307,018
3	Estimated Lost Revenue After Savi	\$859,622	\$1,704,302	\$2,578,591	\$3,222,299	\$3,632,760	\$4,195,714
4	Expected Revenue	\$10,609,938	\$9,054,186	\$7,475,434	\$6,117,219	\$4,958,924	\$3,684,577
5	Drought Revenue Requirement	\$11,469,560	\$10,758,489	\$10,054,025	\$9,339,518	\$8,591,684	\$7,880,291
6	<b>% Increase</b>	<b>8%</b>	<b>19%</b>	<b>34%</b>	<b>53%</b>	<b>73%</b>	<b>114%</b>

### 1.3.4.1. Drought Rate Adoption

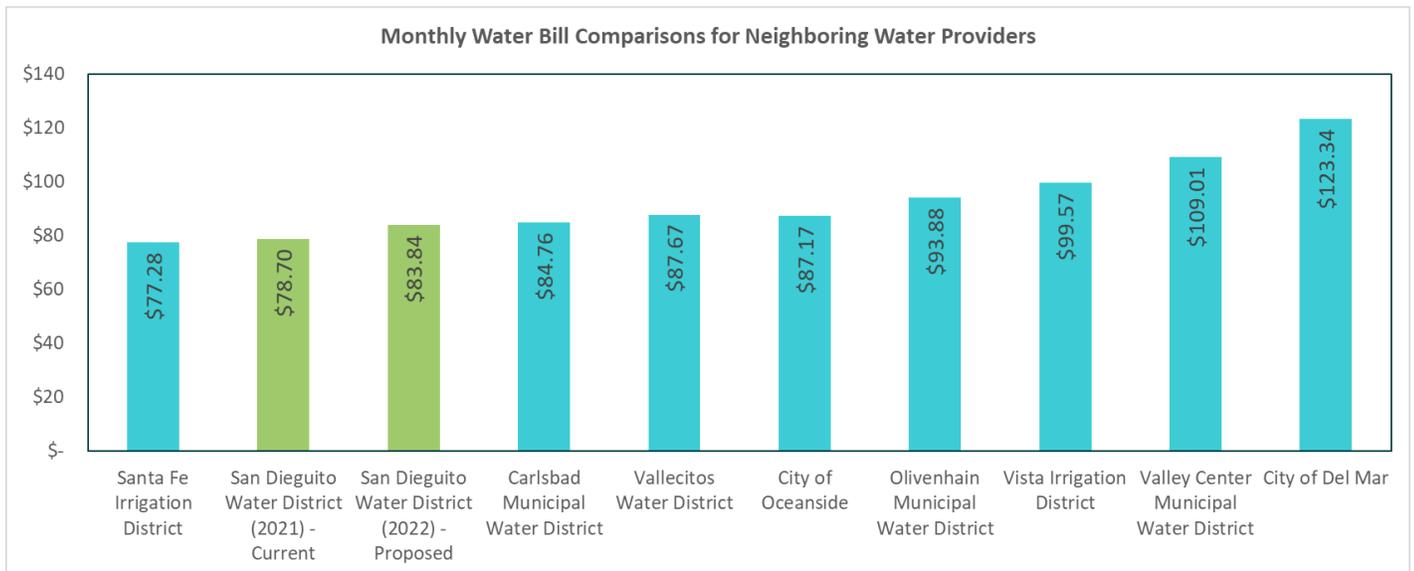
The Board would adopt the drought rates separately from any other type of rate increase. For the duration of the rate proposal period (3 years), the Board would have the ability to adopt drought rates by increasing the then-current commodity rate without having to re-issue the Proposition 218 notice.

### 1.3.5. WATER RATE SURVEY

Raftelis conducted a rate survey to benchmark current and proposed Water rates against eight neighboring water providers. While a useful benchmark, it is worth noting that such comparisons only paint a partial picture since many factors, such as water sources, age and replacement of infrastructure, service area characteristics, revenue sources, and other local conditions, affect the total cost of providing water services.

Figure 1-2 shows a monthly<sup>2</sup> water bill comparison for the current (2021) and proposed (2022) rates against eight neighboring agencies. The survey assumes a single-family residential customer using 12 HCF of water per month, with a 3/4” metered connection. This survey was conducted in March 2021 and should only be used as a reference point or snapshot in time.

**Figure 1-2: Monthly Bill Comparisons for Neighboring Agencies**



<sup>2</sup> Agencies with a bi-monthly billing cycle are adjusted to a monthly billing cycle by dividing fixed charges and tier widths in half.

# 2. Introduction

## 2.1. Study Background

The San Dieguito Water District (District) provides potable water to Leucadia, Old Encinitas, Cardiff, and portions of New Encinitas. The Olivenhain Municipal Water District serves the remainder of the City. The San Dieguito Water District is a subsidiary district of the City of Encinitas. The City Council serves as the Board of Directors of the District. The District operates and maintains 175 miles of pipelines, the 7.5 million-gallon (MG) Encinitas Ranch reservoir, the 2.5 MG Balour Reservoir, 19 pressure reducing stations, 1 pump station, and 11,785 water meters. In addition, the District also jointly owns, with the Santa Fe Irrigation District, the 40 MGD Badger Filtration Plant, a 13 MG clear well, a hydroelectric plant, the San Dieguito Pump Station, the 850 AF San Dieguito Reservoir, and 14 miles of transmission mains.

The District receives local water from Lake Hodges and imported raw water from the San Diego County Water Authority (SDCWA) for potable water. Both sources are treated at the R.E. Badger Filtration Plant located in Rancho Santa Fe. The District and Santa Fe Irrigation District jointly own the treatment facility. Treated water from the San Diego County Water Authority can also be delivered directly to the District. The amount of water available from Lake Hodges varies from year to year; in FY 2022, the District projects to use 2,135 acre-feet (AF) of local water from Lake Hodges and approximately 3,624 AF of imported water from SDCWA. The District also sells recycled water received from the San Elijo Joint Powers Authority (SEJPA). The District's current conservation objectives are driven by limited water resources, regional drought conditions, rapidly increasing costs of imported water, and the volatility of local water supply.

The District strives to conduct water rate studies every two or three years because its water purchase costs can vary significantly from year to year based on local water availability. The District's local surface water is more economical than purchased imported water from the SDCWA. Water from Lake Hodges Dam is the least expensive District water source<sup>3</sup>. Currently, Lake Hodges is operating at reduced capacity under restrictions imposed by the California Department of Water Resources - Division of Safety of Dams. The District, Santa Fe Irrigation District, and the City of San Diego are preparing to participate in a large-scale Capital Project to conduct short and long-term repairs to the Lake Hodges dam. This capital project will be jointly funded and a primary driver of District capital project costs in future years.

The District conducted this water rate study to ensure that water rates and charges are sufficient to meet enterprise revenue requirements. Additionally, the District would like to minimize rate increases and large fluctuations to mitigate potential impacts on the ratepayers after the COVID-19 pandemic that began in spring 2020. The last Study (which the Board approved) recommended revenue increases of 6.5% on May 1, 2019 and May 1, 2020.

In the Fall of 2020, the San Dieguito Water District engaged Raftelis to conduct a Water Rate Study (Study) consisting of a financial plan update, cost of service, and three years of rate adjustments for fiscal year<sup>4</sup> (FY) 2022 through FY 2024. This Report presents the financial plan, Cost of Service, and the resulting rates for implementation on January 1, 2022, January 1, 2023, and January 1, 2024.

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<sup>3</sup> Lake Hodges water is referred to as local raw water in this report.

<sup>4</sup> Note, this report will refer to fiscal years as those ending June 30th of the selected year.

## 2.2. Methodology

Raftelis and the District developed rates using Cost of Service (COS) principles set forth by the American Water Works Association M1 Manual titled *Principles of Water Rates, Fees and Charges* (AWWA M1 Manual). COS principles endeavor to distribute costs to customer classes in proportion to the way each class uses the water system.

Performing a COS study provides the rate basis to meet Proposition 218 requirements – that rates must be based on costs. It is common to set rates for several years before revisiting the COS to minimize customer rate and bill fluctuations. This Study uses the AWWA Base-Extra Capacity Method to distribute costs to customer classes and tiers. This method separates costs into four main cost causation components: base costs, extra capacity costs, customer costs, and fire protection costs. Base costs are associated with meeting average daily demand needs and include operations and maintenance costs and capital costs designed to meet average load conditions. Extra capacity costs are costs (both operating and capital costs) associated with meeting peak demand. Customer costs are costs associated with serving customers, such as meter reading, billing and customer service, etc. Direct fire protection costs are related solely to the fire protection function, such as fire hydrants, fire connections, and related mains and valves.

## 2.3. Key Study Assumptions

The Study period is from FY 2022 to FY 2026. This study develops rates for FY 2022, FY 2023, and FY 2024. Revenue adjustments for FY 2025 and FY 2026 are for planning purposes only, as the District will undertake another rate study in the future. Table 2-1 shows the cost escalation factors assumed in the Study.

**Table 2-1: Cost Escalation Factors**

Line No.	Inflationary Category	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	General	3%	3%	3%	3%	3%	3%
2	Salary	3%	3%	3%	3%	3%	3%
3	Benefits	4%	4%	4%	4%	4%	4%
4	Benefits - Medical	1%	1%	1%	1%	1%	1%
5	Benefits - CalPers	3%	3%	3%	3%	3%	3%
6	Benefits- OPEB	5%	5%	5%	5%	5%	5%
7	Utilities	4%	4%	4%	4%	4%	4%
8	Capital	3%	3%	3%	3%	3%	3%

We developed the inflationary assumptions in consultation with District Staff. The capital inflation rate is based on Engineering News-Record Construction Cost Index average inflation in the past ten years.

Table 2-2 shows the water supply inflationary used to calculate water purchase costs. The SDCWA escalation factors are calculated using the compound annual growth rate of the charges from 2015 to 2021. District staff estimates no inflation of Lake Hodges O&M costs during the Study Period.

**Table 2-2: Water Supply Escalation Factors**

Line No.	Inflationary Category	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	SDCWA Raw Water Rate	4%	4%	4%	4%	4%	4%
2	SDCWA Treated Water Rate	1%	1%	1%	1%	1%	1%
3	SDCWA Infrastructure Access Charge	7%	7%	7%	7%	7%	7%
4	SDCWA Customer Service Charge	1%	1%	1%	1%	1%	1%
5	SDCWA Storage Charge	1%	1%	1%	1%	1%	1%
6	SDCWA Supply Reliability Charge	8%	8%	8%	8%	8%	8%
7	SDCWA Transportation Rate	7%	7%	7%	7%	7%	7%
8	SDCWA Standby Availability Charge	0%	0%	0%	0%	0%	0%
9	MWD Tier 2 Supply Rate	2%	2%	2%	2%	2%	2%
10	MWD Capacity Charge	0%	0%	0%	0%	0%	0%
11	MWD Readiness To Serve	0%	0%	0%	0%	0%	0%
12	City of San Diego LH O&M	0%	0%	0%	0%	0%	0%

Inflationary factors were applied to non-rate revenues and reserve interest earnings to project future revenue.

### 2.3.1. ACCOUNT AND WATER USE GROWTH ASSUMPTIONS

The two factors used to estimate future water rate revenue are new account growth and annual water demand changes. Table 2-3 shows the financial plan assumptions in new water service connections and water use growth for the Study period. District Staff anticipates low account growth since the District is nearly built out and new construction is primarily infill projects. District staff estimates that water demand forecast will annually increase due to warm, dry weather and account growth. The District estimates a 5% water loss assumption for the study period. The additional water purchases above customer demand account for water losses in the system, such as water lost during treatment, leaks in pipes, etc.

**Table 2-3: Account Growth, Water Use, and Water Loss Assumptions**

	FY 2021 Projected	FY 2022 Projected	FY 2023 Projected	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected
<b>Account Growth (Residential)</b>	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
<b>Water Use Growth</b>	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
<b>Water Loss</b>	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%

Table 2-4 shows the estimated number of water accounts, not including Fire Service, by meter size for the Study Period. The number of accounts is used to forecast the amount of fixed revenue the District will receive from Meter Service Charges. Raftelis inflated actual FY 2020 meter counts to estimate FY 2021 meter counts. District staff estimates that most customer growth will occur in the 3/4-inch meter size.

**Table 2-4: Projected Accounts by Meter Size**

Meter Size	FY 2020 Actual	FY 2021 Projected	FY 2022 Projected	FY 2023 Projected	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected
5/8"	3,673	3,673	3,673	3,673	3,673	3,673	3,673
3/4"	5,937	5,966	5,995	6,025	6,054	6,084	6,113
1"	1,519	1,519	1,519	1,519	1,519	1,519	1,519
1.5"	429	429	429	429	429	429	429
2"	414	414	414	414	414	414	414
3"	2	2	2	2	2	2	2
4"	3	3	3	3	3	3	3
6"	0	0	0	0	0	0	0
8"	1	1	1	1	1	1	1
<b>Total</b>	<b>11,978</b>	<b>12,007</b>	<b>12,036</b>	<b>12,066</b>	<b>12,095</b>	<b>12,125</b>	<b>12,154</b>

Table 2-5 shows the projected water use totals by class. Water use by class is escalated by the water use growth assumption shown in Table 2-3.

**Table 2-5: Projected Water Use by Customer Class (HCF)**

Customer Class	FY 2020 Actuals	FY 2021 Projected	FY 2022 Projected	FY 2023 Projected	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected
Single Family Residence (SFR)	1,284,212	1,297,054	1,310,025	1,323,125	1,336,356	1,349,720	1,363,217
SFR -w- Agriculture	16,396	16,560	16,726	16,893	17,062	17,232	17,405
SFR -w- Commercial	1,771	1,789	1,807	1,825	1,843	1,861	1,880
Multi-Family Residence (MFR)	472,626	477,352	482,126	486,947	491,817	496,735	501,702
MFR -w- Agriculture	8,626	8,712	8,799	8,887	8,976	9,066	9,157
MFR -w- Commercial	1,197	1,209	1,221	1,233	1,246	1,258	1,271
Agriculture	82,294	83,117	83,948	84,788	85,635	86,492	87,357
Commercial	218,181	220,363	222,567	224,792	227,040	229,311	231,604
Public	45,878	46,337	46,800	47,268	47,741	48,218	48,700
Government	7,812	7,890	7,969	8,049	8,129	8,210	8,293
Landscaping	144,808	146,256	147,719	149,196	150,688	152,195	153,717
Construction	17,250	17,423	17,597	17,773	17,950	18,130	18,311
<b>Total</b>	<b>2,301,052</b>	<b>2,324,062</b>	<b>2,347,303</b>	<b>2,370,776</b>	<b>2,394,483</b>	<b>2,418,428</b>	<b>2,442,613</b>

# 3. Legal Framework and Rate Setting Methodology

## 3.1. California Constitution – Article XIII D, Section 6 (Prop 218)

Proposition 218, reflected in the California Constitution as Article XIII D, was enacted in 1996 to ensure that rates and fees are proportional to the cost of providing service. The principal requirements for fairness of the fees, as they relate to public water service, are as follows:

1. A property-related charge (such as water and recycled water rates) imposed by a public agency on a parcel shall not exceed the costs required to provide the property-related service.
2. Revenues derived by the charge shall not be used for any purpose other than that for which the charge was imposed.
3. The amount of the charge imposed upon any parcel shall not exceed the proportional cost of service attributable to the parcel.
4. No charge may be imposed for a service unless that service is actually used or immediately available to the owner of the property.
5. A written notice of the proposed charge shall be mailed to the record owner of each parcel at least 45 days prior to the public hearing when the agency considers all written protests against the charge.

As stated in AWWA’s Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices M1, 7th Edition (M1 Manual), “water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers.” Proposition 218 requires that water rates cannot be “arbitrary and capricious,” meaning that the rate-setting methodology must be sound and that there must be a nexus between the costs and the rates charged. This Study follows industry-standard rate-setting methodologies set forth by the M1 Manual, adhering to Proposition 218 requirements by developing rates that do not exceed the proportionate cost of providing water services.

## 3.2. California Constitution – Article X, Section 2

Article X, Section 2 of the California Constitution (established in 1976) states the following:

“It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare.”

Article X, Section 2 of the State Constitution institutes the need to preserve the State’s water supplies and to discourage the wasteful or unreasonable use of water by encouraging conservation. As such, public agencies are constitutionally mandated to maximize the beneficial use of water, prevent waste, and encourage conservation.

### **Cost-Based Rate-Setting Methodology**

As stated in the M1 Manual, “the costs of water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers.” The four major steps to develop utility rates that comply with Proposition 218 and industry standards while meeting other emerging goals and objectives of the utility are discussed below.

### **Calculate Revenue Requirement**

The rate-making process starts by determining the test year (rate-setting year) revenue requirement. The revenue requirement should sufficiently fund the utility’s O&M, debt service, capital expenses, and other identified costs with funding to reserves (positive cash) or using reserves (negative cash), all based on a long-term financial plan.

### **Cost-of-Service Analysis (COS)**

The annual cost of providing water service is distributed among customer classes commensurate with their service requirements. A COS analysis involves the following:

- Functionalize costs. Examples of functions include storage, treatment, and distribution.
- Allocate functionalized costs to cost components. Examples of cost components include supply, base delivery, peaking, and meter servicing.
- Distribute the cost components. Distribute cost components, using unit costs, to customer classes in proportion to their burden on the water system.

### **Rate Design and Calculations**

Rates do more than simply recover costs. Within the legal framework and industry standards, properly designed rates should support and optimize a blend of various utility objectives, such as promoting water conservation, affordability for essential needs, and revenue stability, among other objectives. Rates may also act as a public information tool in communicating these objectives to customers.

### **Rate Adoption**

Rate adoption is the last step of the rate-making process and is part of the procedural requirements of Proposition 218. Raftelis documents the rate study results in this Report to serve as the utility’s administrative record and a public education tool about the proposed changes, the rationale and justifications behind the changes, and their anticipated financial impacts.

Government Code §54999.7(c) requires that water and wastewater agencies must conduct a cost-of-service study a minimum of every ten years. Raftelis conducted a comprehensive cost-of-service rate study for the District in Section 5 and documented the results and findings in this Report. This Study focuses on financial plan updates and incorporates the latest financial information and cost projections for the next five years. The proposed revenue adjustments resulting from the financial plan will be applied across all categories of the updated rates to calculate the proposed rates for FY 2022, FY 2023, and FY 2024.

# 4. Financial Plan

This section describes the assumptions used to project operating and maintenance (O&M) expenses, rate funded capital expenses, reserve targets, and calculate debt service coverage requirements to determine the revenue adjustments required to ensure the District's financial stability. Note that the SDCWA Infrastructure Access Charge (IAC) is not included in the Financial Plan, as it is passed through directly to the customer by the District.

The District has three official Reserves and a contribution fund. The reserve targets are as follows

1. Operating Reserve – 90 days of the annual operating budget
2. Capital Replacement Reserve – at minimum, the average yearly capital expenses over five years maximum is 2 x average yearly CIP expense
3. Rate Stabilization Reserve – 15 % of annual water revenue from rates and charges
4. Vehicle Replacement Contribution. - schedule of cash requirements for fleet replacement based on an amortization schedule, regular vehicle condition assessment, and anticipated vehicle lifespan

Revenue adjustments represent the average rate increase for District customers as a whole; rate increases for individual classes will depend on the cost of service results – since a cost of service analysis allocates costs to each user class.

## 4.1. Operating and Maintenance Expenses

The District's O&M budget is shown by fiscal year in Table 4-1. The O&M budget incorporates the inflationary factors discussed in Table 2-1. Costs are projected to increase largely due to the increase in water purchase costs (Line 14). Administration expenses (Line 1) include general administrative costs and the 15-year repayment schedule for the CalPERS Unfunded Accrued Liability Payment Plan. This payment level was assumed in the last rate study and is scheduled to end in FY 2033.

The water purchase and treatment expenses, summarized in Line 14, are calculated using the projected water use assumptions. SDCWA water supply unit and fixed costs are inflated based on historical averages shown in Table 2-2.

**Table 4-1: Projected O&M Expenses**

Line No.	Line Item	FY 2020 Actuals	FY 2021 Projected	FY 2022 Projected	FY 2023 Projected	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected
1	Administration	\$2,533,329	\$2,649,493	\$2,703,241	\$2,758,657	\$2,815,796	\$2,874,712	\$2,935,461
2	Customer Service	\$747,158	\$898,472	\$925,651	\$953,664	\$982,535	\$1,012,293	\$1,042,963
3	<b>Water Purchases and Treatment</b>							
4	Treatment Costs	\$2,406,285	\$2,851,400	\$2,966,311	\$3,085,854	\$3,210,214	\$3,339,585	\$3,474,171
5	Imported Treated Water	\$281,572	\$453,169	\$349,894	\$362,830	\$376,341	\$390,455	\$405,204
6	Imported Untreated Water	\$3,032,089	\$4,399,333	\$3,676,777	\$3,905,180	\$4,147,688	\$4,405,172	\$4,678,582
7	Local Untreated Water	\$57,077	\$115,000	\$157,000	\$207,000	\$75,000	\$75,000	\$75,000
8	MWD Readiness to Serve	\$31,447	\$32,705	\$27,192	\$27,192	\$27,192	\$27,192	\$27,192
9	CWA Emergency Storage Fee	\$665,458	\$611,425	\$538,527	\$543,913	\$549,352	\$554,845	\$560,394
10	MWD Capacity Reservation	\$86,917	\$85,398	\$82,212	\$82,212	\$82,212	\$82,212	\$82,212
11	CWA Customer Service Fee	\$241,038	\$221,544	\$212,461	\$214,586	\$216,731	\$218,899	\$221,088
12	CWA Supply Reliability	\$351,531	\$403,418	\$406,923	\$439,477	\$474,635	\$512,606	\$553,614
13	<b>Subtotal Water Purchases and Treatment</b>	<b>\$7,153,415</b>	<b>\$9,173,392</b>	<b>\$8,417,298</b>	<b>\$8,868,243</b>	<b>\$9,159,364</b>	<b>\$9,605,966</b>	<b>\$10,077,456</b>
14	Recycled Water Program	\$606,486	\$876,339	\$810,785	\$842,126	\$875,809	\$910,857	\$947,328
15	Field Operations	\$1,898,768	\$2,341,895	\$2,415,798	\$2,492,076	\$2,570,809	\$2,652,076	\$2,735,962
16	Planning and Engineering	\$464,034	\$530,613	\$547,138	\$564,186	\$581,775	\$599,922	\$618,646
17	<b>Total O&amp;M</b>	<b>\$13,403,189</b>	<b>\$16,470,204</b>	<b>\$15,819,910</b>	<b>\$16,478,952</b>	<b>\$16,986,089</b>	<b>\$17,655,827</b>	<b>\$18,357,815</b>

## 4.2. Debt Service

The District is currently obligated to make annual debt service payments for two revenue bonds:

- 2007 Water Revenue Refunding Bonds (2007 Bond);
- Water Revenue Refunding Bonds, Series 2014 (2014 Bond).

Table 4-2 shows the annual debt service associated with the two existing revenue bonds. Table 4-2 shows that both bonds will have matured by FY 2026. This Study assumes no additional debt for the study period.

**Table 4-2: Annual Debt Service**

Line No.	Existing Debt Service	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	2007 Bonds	\$636,466	\$634,397	\$636,044	\$635,916	\$633,950	\$0
2	2014 Bonds	\$765,300	\$768,100	\$769,700	\$770,100	\$0	\$0
3	<b>Total Existing Debt Service</b>	<b>\$1,401,766</b>	<b>\$1,402,497</b>	<b>\$1,405,744</b>	<b>\$1,406,016</b>	<b>\$633,950</b>	<b>\$0</b>

### 4.3. Capital Improvement Program

Table 4-3 summarizes the District’s five-year Capital Improvement Plan. The District has proposed approximately \$22 Million in Capital Expenditures over the Study period. The District plans to finance its capital projects over the Study Period through System Development Charges (Capacity Fees) and rate revenue (also known as PAY-GO funding). The Capital Improvement Plan below is adjusted for inflation<sup>5</sup>.

**Table 4-3: Proposed Capital Improvement Plan**

Line No.	Capital Project Category	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	SDWD Infrastructure Projects	\$999,527	\$751,900	\$1,129,859	\$1,436,936	\$1,142,391	\$1,744,707
2	Joint Facilities Projects and Capital Acquisitions	\$1,900,000	\$1,699,500	\$1,750,485	\$1,803,000	\$2,982,598	\$3,072,076
3	Lake Hodges Capital Repairs	\$500,000	\$515,000	\$530,450	\$546,364	\$562,754	\$579,637
4	<b>Total Inflated CIP</b>	<b>\$3,399,527</b>	<b>\$2,966,400</b>	<b>\$3,410,794</b>	<b>\$3,786,299</b>	<b>\$4,687,744</b>	<b>\$5,396,421</b>

### 4.4. Proposed Financial Plan and Revenue Adjustments

The financial planning model enables the District to set rates and charges to generate enough water revenue to meet the District’s short-term and long-term obligations and avoid significant rate fluctuations. It shows the revenues that will maintain appropriate reserves and provide adequate debt service coverage while maintaining a sensitivity to ratepayers rate increases.

Table 4-4 shows the proposed revenue adjustments and CIP accomplishment rate selected by the Board of Directors at the June 16, 2021 Board Meeting. The proposed financial plan implements a gradual increase of revenue adjustments on January 1 for each year. To enable these revenue adjustments, the Capital Accomplishment decreased in FY 2023-2024. This proposed scenario allows the District to maintain reserves and mitigate impacts that ratepayers see to their bill directly. Revenue adjustments are shown outside the rate-setting period (FY 2025 & FY 2026) *for planning purposes only* and are subject to the District Board’s approval in future years. The blue box shows the revenue adjustments that the District will implement for the next three years.

**Table 4-4: Proposed Revenue Adjustments and Capital Accomplishment Rate**

Fiscal Year	Proposed Revenue Adjustments	Proposed CIP Accomplishment
2022	5.5%	100%
2023	6.0%	75%
2024	6.5%	75%
2025	5.0%	75%
2026	5.0%	75%

Table 4-5 shows the proposed financial plan incorporating the proposed revenue adjustments and CIP accomplishment rate. Line 1 shows revenue from current rates, assuming no increase in rates. Rate revenue from current rates includes water, recycled water, and private fire customers and consumption, where applicable. Rate

<sup>5</sup> Capital inflation percentages are shown in Table 2-1.

revenues were calculated using the water use and customer account assumptions shown in Section 2.3. Line 2 shows the additional revenue received from the revenue adjustments proposed in Table 4-4. Lines 3 - 6 shows non-rate revenues. Interest revenues (Line 6) decrease in FY 2024 due to declining reserve balances due caused by the negative net cash flow (Line 21). Line 7 shows all projected revenues, including rate revenue, non-rate revenue, and interest revenue. Lines 10 – 15 summarizes the O&M projections shown in Table 4-1. Line 16 shows the existing debt service (Table 4-2 ). Line 18 shows the CIP Expenditures (Table 4-3) adjusted for the reduced accomplishment proposed in Table 4-4. Total expenses, including O&M, debt service, and rate funded capital, are shown in Line 19. Line 21 shows a negative net cash flow FY 2021 through FY 2023, largely due to the planned expenditures in capital facilities during those years. The debt coverage ratio is projected to exceed the target debt coverage ratio throughout the study period. The proposed financial plan ensures financial sufficiency and solvency for the District to meet projected expenditures and financial obligations, including debt service, debt coverage, and most reserve targets while funding CIP projects at a reduced capacity.

**Table 4-5: Proposed Financial Plan Cashflow**

Line No.	Cash Flow	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	<b>Revenue from Rates</b>	\$16,191,174	\$16,591,869	\$16,714,270	\$16,837,854	\$16,962,635	\$17,088,623
2	Additional Revenue from Revenue Adjustments	\$0	\$456,276	\$1,448,291	\$2,603,886	\$3,744,743	\$4,815,616
3	Misc Operating Revenue	\$497,624	\$505,517	\$513,612	\$521,914	\$530,430	\$539,165
4	Property Taxes	\$1,081,600	\$1,081,600	\$1,081,600	\$1,081,600	\$1,081,600	\$1,081,600
5	Capital Revenue	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
6	Interest Revenue (Pooled Investment Earnings)	\$293,201	\$206,294	\$190,034	\$187,119	\$196,134	\$218,394
7	<b>Total Revenue</b>	<b>\$18,163,599</b>	<b>\$18,941,557</b>	<b>\$20,047,807</b>	<b>\$21,332,373</b>	<b>\$22,615,542</b>	<b>\$23,843,398</b>
8							
9	<b>Expenses</b>						
10	Administration	\$2,649,493	\$2,703,241	\$2,758,657	\$2,815,796	\$2,874,712	\$2,935,461
11	Customer Service	\$898,472	\$925,651	\$953,664	\$982,535	\$1,012,293	\$1,042,963
12	Water Purchases and Treatment	\$9,173,392	\$8,417,298	\$8,868,243	\$9,159,364	\$9,605,966	\$10,077,456
13	Recycled Water Program	\$876,339	\$810,785	\$842,126	\$875,809	\$910,857	\$947,328
14	Field Operations	\$2,341,895	\$2,415,798	\$2,492,076	\$2,570,809	\$2,652,076	\$2,735,962
15	Planning and Engineering	\$530,613	\$547,138	\$564,186	\$581,775	\$599,922	\$618,646
16	Existing Debt Service	\$1,401,766	\$1,402,497	\$1,405,744	\$1,406,016	\$633,950	\$0
17	Proposed Debt Service	\$0	\$0	\$0	\$0	\$0	\$0
18	Rate Funded CIP	\$3,399,527	\$2,966,400	\$2,558,095	\$2,839,724	\$3,515,808	\$4,047,316
19	<b>Total - Expenses</b>	<b>\$21,271,497</b>	<b>\$20,188,807</b>	<b>\$20,442,790</b>	<b>\$21,231,828</b>	<b>\$21,805,585</b>	<b>\$22,405,131</b>
20							
21	<b>Net Cash Flow</b>	<b>-\$3,107,897</b>	<b>-\$1,247,250</b>	<b>-\$394,983</b>	<b>\$100,545</b>	<b>\$809,957</b>	<b>\$1,438,267</b>
22	Debt Service Coverage	121%	223%	254%	309%	782%	
	Target Coverage	115%	115%	115%	115%	115%	115%

Figure 4-1 graphically illustrates the operating Financial Plan – it compares existing (current) and proposed revenues with projected expenses. The stacked bars show expenses, including O&M expenses, debt service, and rate-funded CIP. Total revenues at existing and proposed rates are shown by horizontal light blue and dark blue lines. Current revenue from existing rates, in light blue, does not meet future total expenses and shows the need for revenue adjustments.

Figure 4-1: Proposed Financial Plan

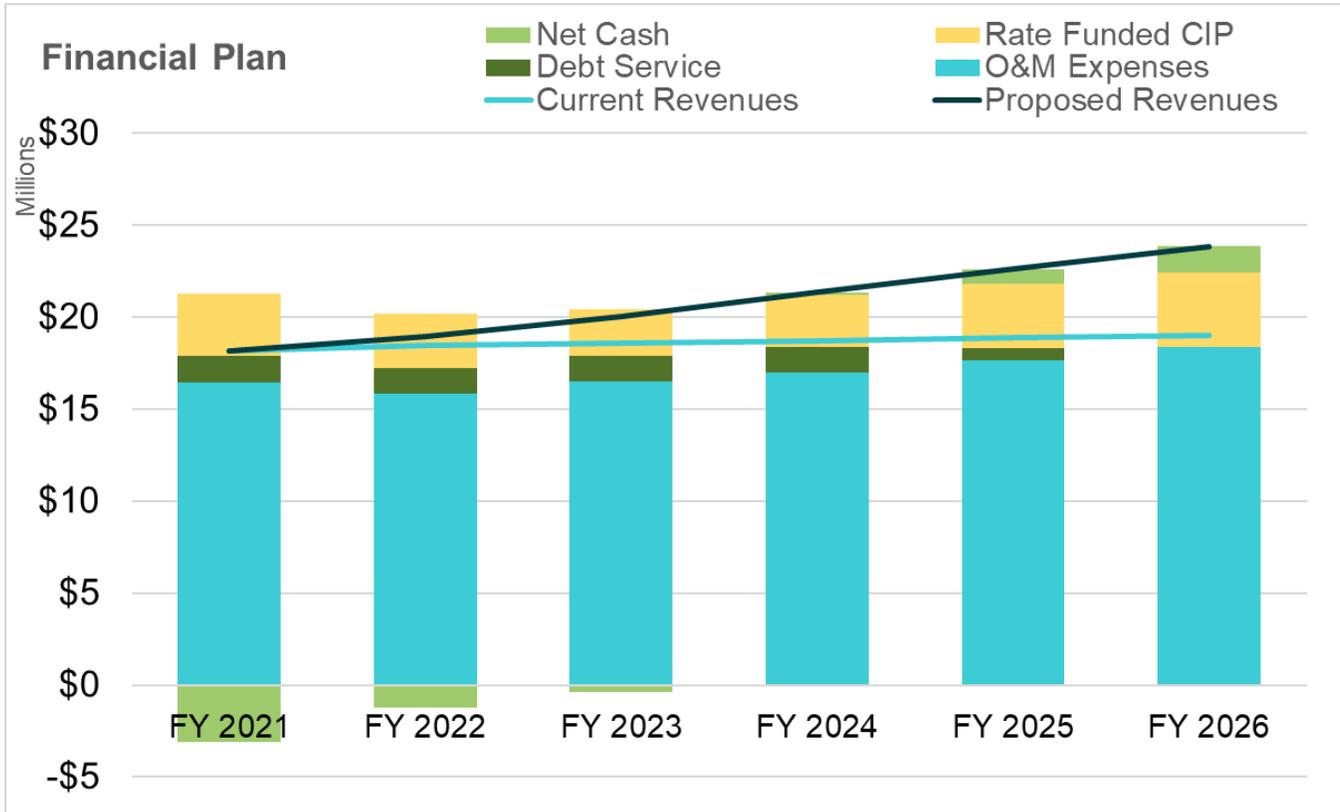


Figure 4-2 shows the modeled revenue adjustments (yellow bars) and graphs the calculated and minimum debt coverage requirements as shown by the green and respectively. The debt coverage ratios increase due to District bonds maturing in FY 2024 and FY 2025 (Table 4-2).

**Figure 4-2: Projected Debt Coverage Ratios and Revenue Adjustments**

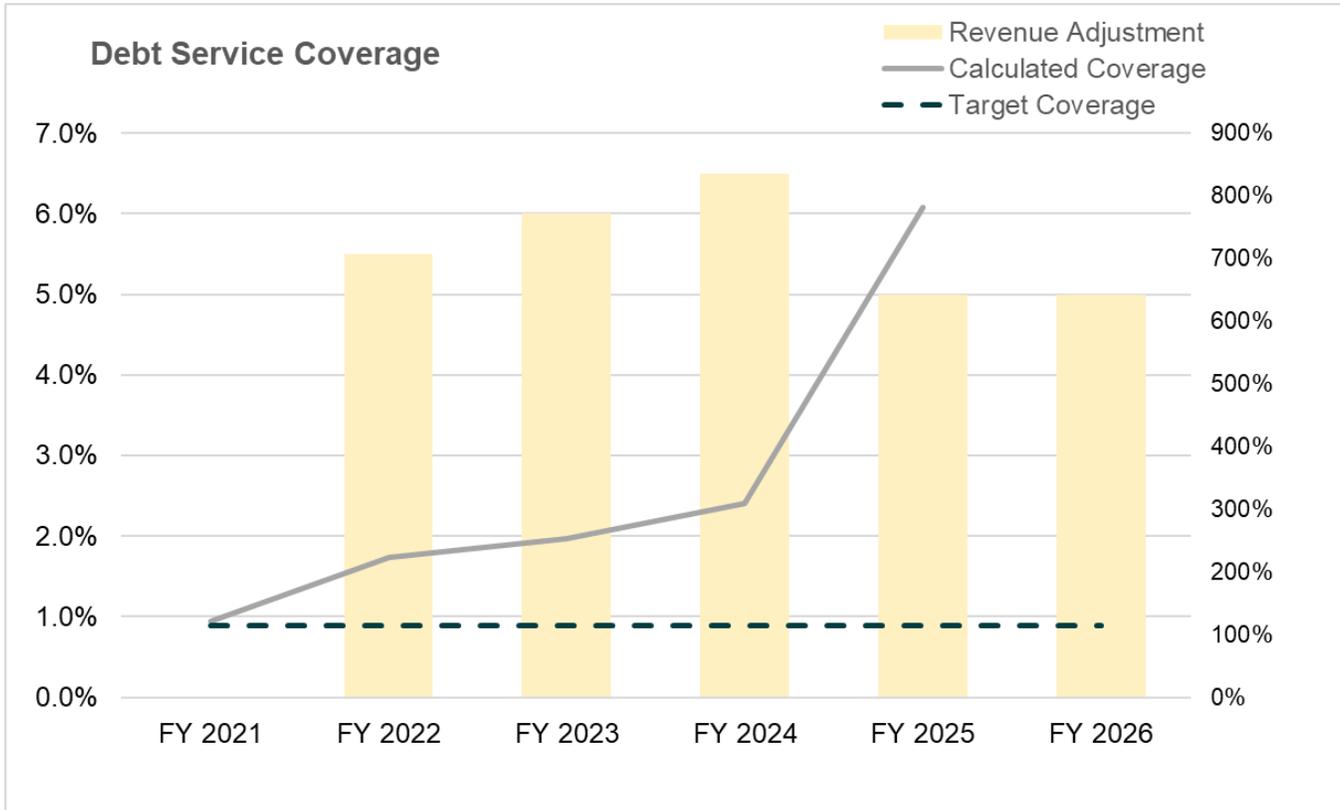


Figure 4-3 summarizes the projected CIP and its funding sources solely rate revenue. CIP costs depicted account for inflation and are adjusted for the CIP accomplishment rate proposed in Table 4-4.

Figure 4-3: Proposed Capital Financing Plan

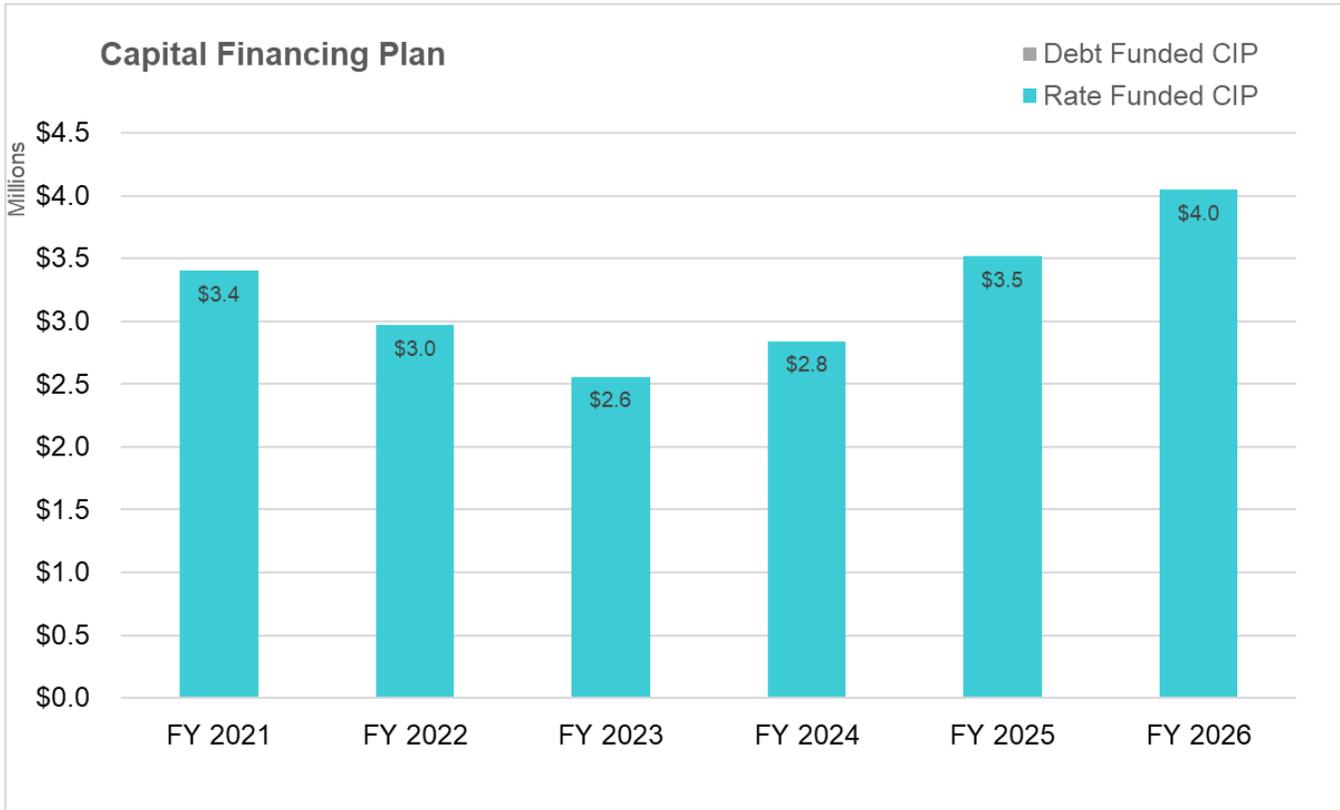
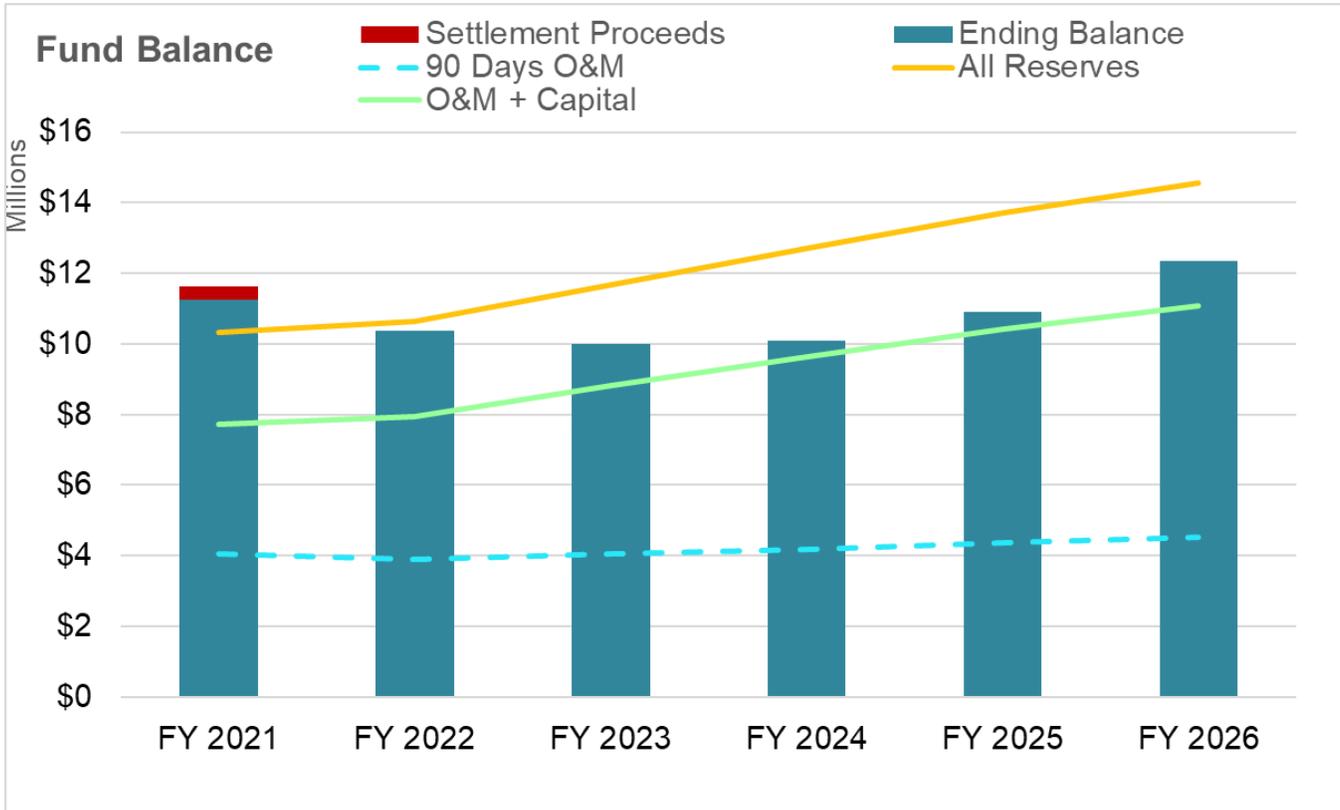


Figure 4-4 shows the projected Water Utility Fund ending balances exceed the O&M and Capital Reserve target balances under the proposed financial plan, depicted as the green line. In addition to the starting balance, FY 2021 shows the SDCWA settlement proceeds in the red bar. These proceeds help decrease rates by helping the water fund to meet reserve targets. Note that the yellow line includes the rate stabilization reserve and with these revenue adjustments, the District is only partially funding the rate stabilization reserve. This demonstrates the necessity for the proposed revenue adjustments and new debt issuance in the proposed financial plan.

Figure 4-4: Projected Fund Ending Balances



# 5. Cost of Service Analysis

A Cost of Service (COS) analysis distributes a utility’s revenue requirement, i.e., the yearly revenue needed, to each customer class by allocating the District’s revenue requirement to the cost causation components. The cost causation components include:

1. Base (average) costs
2. Peaking costs
3. Meter service
4. Billing and customer service
5. Fire protection
6. Conservation
7. Recycled Water
8. General and administrative costs

Peaking costs can be further divided into maximum day and maximum hour demand. The maximum day demand is the maximum amount of water used in a single day in a year. The maximum hour demand is the maximum hour usage on the maximum usage day. Both maximum day and maximum hour peaking demand are used to calculate peaking unit rates to distribute costs to customer classes. Peaking costs are allocated in proportion to how the different customer classes use water during peak day and hour demands. Different facilities, such as distribution and storage facilities, are designed to meet the peaking demands of customers. Extra capacity costs include the O&M and capital costs associated with meeting peak customer demand. This method is consistent with the AWWA M1 Manual and is widely used in the water industry to perform the cost of service analyses.

## 5.1. Allocation to Cost Components

In a COS analysis, expenses are allocated to the cost causation components. Table 5-1 shows the system-wide peaking factors. The system-wide peaking factors are used to derive the cost component allocation bases (i.e., percentages) shown in columns C through E of Table 5-2. To understand the interpretation of the percentage, we must first establish the base as the average daily demand during the year – which is assigned an allocation basis of 1. If the base allocation basis is used to allocate an expense, the costs associated with that expense are to meet average daily demand (base) related costs. Expenses that are allocated to the cost causation components using the Maximum Day bases attribute 59% ( $1.00/1.70$ ) of the demand (and therefore costs) to base (average daily demand) use and the remaining 41% to maximum day (peaking) use. Expenses allocated using the maximum hour bases assume 33% ( $1.00/3.00$ ) of costs are due to base demands, 33% due to max day ( $(1.70-1.00)/3.00$ ) and 43% ( $(3.00-1.70)/3.00$ ) are due to max hour costs. Collectively the maximum day and hour cost components are known as peaking costs. These allocation bases are used to assign O&M Functions, shown in Column A of Table 5-2, to the cost causation components, visible as the column headers of Table 5-2.

**Table 5-1: System-Wide Peaking Factors**

System Peaking	Factor	Base	Max Day	Max Hour
Base	1.00	100%	0%	0%
Max Bi-monthly / Avg Bi-monthly	1.24	81%	19%	0%
Max Day	1.70	59%	41%	0%
Max Hour	3.00	33%	23%	43%

Table 5-2 shows the allocation of the District's O&M expenses to the cost causation components. The percentages shown in Lines 1 through 20 are used to allocate the functionalized costs to each cost causation component. The allocation basis is selected based on the type of cost for each line item and the proportion of those costs associated with each cost causation component (max day, max hour, general, customer, etc.). For example, Transmission & Distribution (Line 14) is allocated using the max hour basis; in proportion to max hour allocations identified in Table 5-1. This is because the distribution and storage system must be sized and operated to meet max hour demands. Certain cost bases are identical to the cost causation components – such as Meter Service – and are easily allocated to the cost component with the same name. Line 42 shows the result of the allocation of all expenses to the cost causation components. Line 44 shows the total percentage allocated to each cost component, excluding Admin and General and Recycled Water. This reflects the fact that general and administrative costs support the other functions in proportion to their share of costs, and Recycled Water costs are recovered through recycled water rates. The Operating portion of the revenue requirement is allocated to the cost causation components using the allocation shown in Line 44 –this is shown later in Table 5-6.

**Table 5-2: Allocation of O&M Expenses to Cost Causation Components**

Line No.	Function	Allocation Basis	Base	Max Day	Max Hour	Meter Service / Capacity	Customer Billing	Conservation	General	Recycled Water	Private Fire Meter	Total
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)
1	<b>Water Purchase and Treatment</b>											
2	Treatment Costs	Max Bi-monthly / Average Bi-monthly	81%	19%	0%	0%	0%	0%	0%	0%	0%	100%
3	Imported Treated Water	Base	100%	0%	0%	0%	0%	0%	0%	0%	0%	100%
4	Imported Untreated Water	Base	100%	0%	0%	0%	0%	0%	0%	0%	0%	100%
5	Local Untreated Water	Base	100%	0%	0%	0%	0%	0%	0%	0%	0%	100%
6	MWD Readiness To Serve	Base	100%	0%	0%	0%	0%	0%	0%	0%	0%	100%
7	SDCWA Infrastructure Acces	Base	100%	0%	0%	0%	0%	0%	0%	0%	0%	100%
8	SDCWA Emergency Storage Fe	Meter Service	0%	0%	0%	100%	0%	0%	0%	0%	0%	100%
9	MWD Capacity Reservation	Max Day	59%	41%	0%	0%	0%	0%	0%	0%	0%	100%
10	SDCWA Customer Service Fee	Meter Service	0%	0%	0%	100%	0%	0%	0%	0%	0%	100%
11	SDCWA Supply Reliability	Max Day	59%	41%	0%	0%	0%	0%	0%	0%	0%	100%
12												
13	<b>Treatment</b>	Max Bi-monthly / Average Bi-monthly	81%	19%	0%	0%	0%	0%	0%	0%	0%	100%
14	<b>Transmission &amp; Distribution</b>	Max Hour	33%	23%	43%	0%	0%	0%	0%	0%	0%	100%
15	<b>Distribution Storage</b>	Max Hour	33%	23%	43%	0%	0%	0%	0%	0%	0%	100%
16	<b>Customer Service &amp; Meter Reading</b>	Billing & Customer Service	0%	0%	0%	0%	86%	14%	0%	0%	0%	100%
17	<b>Meter Service</b>	Meter Service	0%	0%	0%	100%	0%	0%	0%	0%	0%	100%
18	<b>Admin &amp; General</b>	General & Administration	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%
19	<b>Recycled Water</b>	Recycled	0%	0%	0%	0%	0%	0%	0%	100%	0%	100%
20	<b>Private Fire Meter Maintenance</b>	Private Fire Meter Charge	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
21												
	Function		Base	Max Day	Max Hour	Meter Service / Capacity	Customer Billing	Conservation	General	Recycled Water	Private Fire Meter	Total
22	<b>Water Purchase and Treatment</b>											
23	Treatment Costs	Max Bi-monthly / Average Bi-monthly	\$2,392,187	\$574,125	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,966,311
24	Imported Treated Water	Base	\$349,894	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$349,894
25	Imported Untreated Water	Base	\$3,676,777	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,676,777
26	Local Untreated Water	Base	\$157,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$157,000
27	MWD Readiness To Serve	Base	\$27,192	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$27,192
28	SDCWA Infrastructure Acces	Base	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
29	SDCWA Emergency Storage Fe	Meter Service	\$0	\$0	\$0	\$538,527	\$0	\$0	\$0	\$0	\$0	\$538,527
30	MWD Capacity Reservation	Max Day	\$48,360	\$33,852	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$82,212
31	SDCWA Customer Service Fee	Meter Service	\$0	\$0	\$0	\$212,461	\$0	\$0	\$0	\$0	\$0	\$212,461
32	SDCWA Supply Reliability	Max Day	\$239,366	\$167,556	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$406,923
33												
34	<b>Treatment</b>	Max Bi-monthly / Average Bi-monthly	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
35	<b>Transmission &amp; Distribution</b>	Max Hour	\$512,060	\$358,442	\$665,679	\$0	\$0	\$0	\$0	\$0	\$0	\$1,536,181
36	<b>Distribution Storage</b>	Max Hour	\$179,291	\$125,504	\$233,078	\$0	\$0	\$0	\$0	\$0	\$0	\$537,873
37	<b>Customer Service &amp; Meter Reading</b>	Billing & Customer Service	\$0	\$0	\$0	\$0	\$891,979	\$145,206	\$0	\$0	\$0	\$1,037,185
38	<b>Meter Service</b>	Meter Service	\$0	\$0	\$0	\$610,347	\$0	\$0	\$0	\$0	\$0	\$610,347
39	<b>Admin &amp; General</b>	General & Administration	\$0	\$0	\$0	\$0	\$0	\$0	\$2,730,597	\$0	\$0	\$2,730,597
40	<b>Recycled Water</b>	Recycled	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$810,785	\$0	\$810,785
41	<b>Private Fire Meter Maintenance</b>	Private Fire Meter Charge	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$57,572	\$57,572
42	<b>Total</b>		<b>\$7,582,128</b>	<b>\$1,259,479</b>	<b>\$898,757</b>	<b>\$1,361,335</b>	<b>\$891,979</b>	<b>\$145,206</b>	<b>\$2,730,597</b>	<b>\$810,785</b>	<b>\$57,572</b>	<b>\$15,737,839</b>
43												
44	<b>Allocation (Omitting General and Recycled Water)</b>		51%	8%	6%	9%	6%	1%	18%	0%	0%	100%

The District’s functionalized assets are allocated to the same cost components as the O&M expenses. Capital costs are allocated in proportion to the functionalized assets to recognize that all assets need to be refurbished and replaced over time. This ensures that the allocations to the cost causation components and the rates remain relatively stable over time.

Raffelis, with the assistance of District staff, functionalized and allocated capital assets to the cost causation components. The assets were valued using the replacement cost less depreciation by escalating cost with the Engineering News-Record Construction Cost Index. Table 5-3 summarizes the allocation of the District’s capital assets to the cost causation components. The resulting total asset allocation is derived in the same manner as the O&M allocation in Table 5-2. Raffelis functionalized the District’s assets (Lines 1 through 7 of Table 5-3) and then allocated the value to the cost causation components (Lines 9 - 17). Part of the District’s revenue requirement includes rate-funded capital projects. This capital portion of the revenue requirement is allocated to the cost causation components using the asset allocation shown in Line 20. Line 20 shows the total percentage allocated to each cost component, excluding Admin and General. This reflects that general and administrative costs support the other functions in proportion to their share of costs.

**Table 5-3: Allocation of Assets to Cost Causations Components**

Line No.	Description	Allocation Basis	Base	Max Day	Max Hour	Meter Service / Capacity	Customer Billing	Conservation	General	Total
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1	Supply	Base	100%	0%	0%	0%	0%	0%	0%	100%
2	Treatment	Base	100%	0%	0%	0%	0%	0%	0%	100%
3	Transmission & Distribution	Max Hour	33%	23%	43%	0%	0%	0%	0%	100%
4	Reservoir/Storage	Max Day	59%	41%	0%	0%	0%	0%	0%	100%
5	Customer Billing	Billing & Custom	0%	0%	0%	0%	86%	14%	0%	100%
6	Meter Service	Meter Service	0%	0%	0%	100%	0%	0%	0%	100%
7	Admin & General	General & Admir	0%	0%	0%	0%	0%	0%	100%	100%
8										
9			Base	Max Day	Max Hour	Meter Service / Capacity	Customer Billing	Conservation	General	Total
10										
11	Supply		\$3,369,737	\$0	\$0	\$0	\$0	\$0	\$0	\$3,369,737
12	Treatment		\$343,192	\$0	\$0	\$0	\$0	\$0	\$0	\$343,192
13	Transmission & Distribution		\$4,706,922	\$3,294,846	\$6,118,999	\$0	\$0	\$0	\$0	\$14,120,767
14	Reservoir/Storage		\$3,657,759	\$2,560,431	\$0	\$0	\$0	\$0	\$0	\$6,218,190
15	Customer Billing		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
16	Meter Service		\$0	\$0	\$0	\$793,698	\$0	\$0	\$0	\$793,698
17	Admin & General		\$0	\$0	\$0	\$0	\$0	\$0	\$5,133,529	\$5,133,529
18										
19	<b>Total Assets</b>		<b>\$12,077,610</b>	<b>\$5,855,277</b>	<b>\$6,118,999</b>	<b>\$793,698</b>	<b>\$0</b>	<b>\$0</b>	<b>\$5,133,529</b>	<b>\$29,979,114</b>
20	<b>Resulting Allocation (Omitting General)</b>		49%	24%	25%	3%	0%	0%	0%	100%

## 5.2. Revenue Requirement Determination

Table 5-4 shows the revenue requirement determination. Line 26 shows the total revenue required from rates, calculated by subtracting revenue offsets (Line 18) and Adjustments (Line 23) from the Operating and Capital Revenue Requirements (Line 10). Line 25 shows the operating and capital revenue requirements before subtracting revenue offsets by adding Line 10 and 23. Raftelis calculated the revenue requirement using the FY 2022 budget, including water purchases, O&M expenses, capital expenses, and existing debt service, as shown in lines 1 – 10. Lines 13 – 17 show the Revenue Offsets from non-rate revenues. The adjustments in Lines 21 and 22 ensure the COS accounts for the annual cash balances and that the impending rate adjustment will take place six months into FY 2022.

**Table 5-4: Revenue Requirement Determination**

Line No.	Description (A)	Operating (B)	Capital (C)	Total (D)
1	<b>Revenue Requirement</b>			
2	Administration	\$2,703,241		\$2,703,241
3	Customer Service	\$925,651		\$925,651
4	Water Purchases and Treatment	\$8,417,298		\$8,417,298
5	Recycled Water Program	\$810,785		\$810,785
6	Field Operations	\$2,415,798		\$2,415,798
7	Planning and Engineering	\$547,138		\$547,138
8	Total Debt Service Expenses		\$1,402,497	\$1,402,497
9	Rate Funded Capital Projects		\$2,966,400	\$2,966,400
10	<b>Total Revenue Requirement</b>	<b>\$15,819,910</b>	<b>\$4,368,897</b>	<b>\$20,188,807</b>
11				
12	<b>Revenue Offsets</b>			
13	Misc Operating Revenue	\$505,517		\$505,517
14	Property Taxes - Applied to Specific Tiers	\$540,800		\$540,800
15	Property Taxes - General Offset	\$540,800		\$540,800
16	Capital Revenue		\$100,000	\$100,000
17	Interest Revenue (Pooled Investment Earnings)	\$206,294		\$206,294
18	<b>Total Revenue Offsets</b>	<b>\$1,793,411</b>	<b>\$100,000</b>	<b>\$1,893,411</b>
19				
20	<b>Adjustments</b>			
21	Adjustment for Cash Balance		\$1,247,250	\$1,247,250
22	Adjustment for Mid-year Increase	(\$456,276)		(\$456,276)
23	<b>Total Adjustments</b>	<b>(\$456,276)</b>	<b>\$1,247,250</b>	<b>\$790,973</b>
24				
25	<b>Revenue Requirement Before Revenue Offsets</b>	<b>\$15,363,633</b>	<b>\$5,616,147</b>	<b>\$20,979,780</b>
26	<b>Revenue Required from Rates</b>	<b>\$14,482,775</b>	<b>\$3,021,647</b>	<b>\$17,504,422</b>

### 5.3. Preliminary Allocation of Revenue Requirements to Cost Components

Table 5-5 shows the allocation of the revenue offsets to cost components. Non-rate revenue and a portion of property taxes are allocated to O&M, based on the expense allocation percentages derived in Table 5-2. Capital Revenue is allocated to capital, based on asset allocation percentages derived in Table 5-3. A portion of property tax revenue is allocated to the Revenue Offset cost component and used as a rate offset to decrease rates for Residential tiers 1 and 2 and commercial/agricultural customers.

**Table 5-5: Allocation of Revenue Offsets to Cost Components**

Line No.	Description	Allocation Basis	Base	Max Day	Max Hour	Meter Service / Capacity	Customer Billing	Conservation	General	Recycled Water	Private Fire Meter	Revenue Offset	Total
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
1	Misc Operating Revenue	O&M	51%	8%	6%	9%	6%	1%	18%	0%	0%	0%	100%
2	Property Taxes - Applied to Specific Tiers	Revenue Offset	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
3	Property Taxes - General Offset	O&M	51%	8%	6%	9%	6%	1%	18%	0%	0%	0%	100%
4	Capital Revenue	Capital	49%	24%	25%	3%	0%	0%	0%	0%	0%	0%	100%
5	Interest Revenue (Pooled Investment Earnings)	O&M	51%	8%	6%	9%	6%	1%	18%	0%	0%	0%	100%
6													
7			Base	Max Day	Max Hour	Meter Service / Capacity	Customer Billing	Conservation	General	Recycled Water	Private Fire Meter	Revenue Offset	Total
8													
9	Misc Operating Revenue		\$256,775	\$42,653	\$30,437	\$46,103	\$30,208	\$4,918	\$92,474	\$0	\$1,950	\$0	\$505,517
10	Property Taxes - Applied to Specific Tiers		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$540,800	\$540,800
11	Property Taxes - General Offset		\$274,697	\$45,630	\$32,562	\$49,321	\$32,316	\$5,261	\$98,928	\$0	\$2,086	\$0	\$540,800
12	Capital Revenue		\$50,795	\$8,438	\$6,021	\$9,120	\$5,976	\$973	\$18,293	\$0	\$386	\$0	\$100,000
13	Interest Revenue (Pooled Investment Earnings)		\$100,281	\$48,617	\$50,806	\$6,590	\$0	\$0	\$0	\$0	\$0	\$0	\$206,294
14	<b>Total Revenue Offsets</b>		<b>\$682,548</b>	<b>\$145,338</b>	<b>\$119,826</b>	<b>\$111,133</b>	<b>\$68,499</b>	<b>\$11,151</b>	<b>\$209,695</b>	<b>\$0</b>	<b>\$4,421</b>	<b>\$540,800</b>	<b>\$1,893,411</b>

Table 5-6 shows a preliminary allocation of costs, including O&M Expenses (Table 5-2), Capital Expenses (Table 5-3), and Revenue Offsets (Table 5-5) based on the revenue requirement determined in Table 5-4, prior to an adjustment for fire-related capacity costs. Line 1 in Table 5-6 allocates the operating revenue requirement to the cost components using the percentages shown in Table 5-4 (Line 27, Column B). The total amount, in column L, was calculated with the total operating revenue requirement less the adjustments. Line 2 in Table 5-6 allocates the capital revenue requirement, in column L, to the cost components using the percentages shown in Table 5-3. Line 3 subtracts the allocated revenue offset (Table 5-5). Line 4 shows the preliminary allocation of revenue requirements to the cost components.

**Table 5-6: Preliminary Allocation of Costs to Cost Components**

Line No.	Description	Base	Max Day	Max Hour	Meter Service / Capacity	Customer Billing	Conservation	General	Recycled Water	Private Fire Meter	Revenue Offset	Total
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)
1	Operating Expenses	\$7,841,491	\$1,302,563	\$929,501	\$1,407,903	\$922,491	\$150,173	\$2,824,003	\$838,520	\$59,542	\$0	\$16,276,186
2	Capital Expenses	\$1,517,454	\$735,668	\$768,803	\$99,722	\$0	\$0	\$0	\$0	\$0	\$0	\$3,121,647
3	Revenue Offsets	(\$682,548)	(\$145,338)	(\$119,826)	(\$111,133)	(\$68,499)	(\$11,151)	(\$209,695)	\$0	(\$4,421)	(\$540,800)	(\$1,893,411)
4	<b>Total Cost of Service</b>	<b>\$8,676,398</b>	<b>\$1,892,893</b>	<b>\$1,578,478</b>	<b>\$1,396,491</b>	<b>\$853,992</b>	<b>\$139,022</b>	<b>\$2,614,308</b>	<b>\$838,520</b>	<b>\$55,121</b>	<b>(\$540,800)</b>	<b>\$17,504,422</b>

## 5.4. Equivalent Meters

The concept of equivalent meters needs to be understood to allocate meter-related costs appropriately. By using equivalent meters instead of a total meter count, the analysis accounts for the fact that larger meters impose greater demands on the system and are more expensive to install, maintain, and replace than smaller meters. Equivalent meters are used in calculating meter service costs.

Equivalent meters are based on meter hydraulic capacity. Equivalent meters represent the potential demand on the water system in terms of the base meter size. A ratio of hydraulic capacity is calculated by dividing large meter capacities by the base meter capacity. The capacity ratio is calculated using the meter capacity in gallons per minute (GPM) provided in the AWWA M1 Manual Principles of Water Rates, Fees, and Charges (7th Edition).

The base meter is the most common smallest meter, in this case, a 3/4-inch meter. The capacity ratio is proportional to the potential flow through each meter size as established by the American Water Works Association (AWWA) hydraulic capacity ratios. For example, the flow through a 4-inch meter is 16.7 times that of a 3/4-inch meter, and therefore, the meter capacity component of the fixed meter charge should be 16.7 times that of the 3/4-inch meter. Table 5-7 shows the total equivalent meters (Column D), calculated by taking the number of meters by size (Column C) and multiplied by the corresponding capacity ratio (Column B). The number of annual equivalent meters is calculated by multiplying the equivalent meters by six bi-monthly billing periods. These totals are used as the denominator in developing unit costs for the rate components of the bi-monthly fixed service charges.

**Table 5-7: Water Equivalent Meters**

Meter Size	Capacity Ratios	Total Meters	Equivalent Meters	Annual Equivalent Meters
(A)	(B)	(C)	(D)	(E)
5/8"	1.00	3,673	3,673	22,038
3/4"	1.00	5,995	5,995	35,971
1"	1.67	1,519	2,537	15,220
1.5"	3.33	429	1,429	8,571
2"	5.33	414	2,207	13,240
3"	10.00	2	20	120
4"	16.67	3	50	300
6"	33.33	0	0	0
8"	53.33	1	53	320
<b>Total</b>		<b>12,036</b>	<b>15,964</b>	<b>95,781</b>

## 5.5. Allocation of Private Fire Costs

Water systems provide two types of fire protection: private fire protection that provide fire flow to buildings and other structure sprinkler systems for fire suppression within private improvements, and public fire protection for firefighting, generally visible as hydrants on the street. Raftelis uses the potential flow of private fire lines and public hydrants to determine the share of total fire costs responsible for each.

Table 5-8 shows the equivalent potential demand from private fire lines. Different fire connection sizes have a different fire flow demand factor like the hydraulic capacity factor of a water meter<sup>6</sup>. The count of connections (Column C) by size is multiplied by the fire flow demand factor (Column B) to derive total equivalent fire demand units (Column D). The Hazen-Williams equation is used to calculate equivalent potential demand by raising the pipeline's diameter to the power of 2.63<sup>7</sup>.

**Table 5-8: Private Fire Connections**

Private Fire Connection Size (A)	Fire Demand Ratio (B)	Number of Lines (C)	Equivalent Potential Private Demand (D)
5/8"	0.30	0	0
3/4"	0.47	0	0
1"	1.00	2,262	2,262
1.5"	2.90	1	3
2"	6.19	23	142
3"	17.98	0	0
4"	38.32	89	3,410
6"	111.31	61	6,790
8"	237.21	20	4,744
<b>Total Fire Lines</b>		<b>2,456</b>	<b>17,352</b>

Table 5-9 shows the equivalent potential demand from public fire hydrants. Fire hydrant fire ratios are based on the size and number of ports to calculate the fire flow demand factor. The fire ratio for each hydrant type can be calculated by summing all the hydrant ports raised to the power of 2.63<sup>8</sup>. The total equivalent potential demand (Column D) is calculated by multiplying the number of hydrants (Column C) by the calculated fire flow demand factor (Column B).

**Table 5-9: Public Fire Hydrants**

Fireline Size (inch diameter) (A)	Fire Ratio based on Port Size/Count (B)	Number of Hydrants (C)	Equivalent Potential Demand (D)
1 x 2.5", 1 x 4"	49.45	1,069	52,864
1 x 2.5", 2 x 4"	87.77	370	32,475
1 x 2.5", 4 x 4"	164.41	1	164
2 x 2.5", 1 x 4"	60.58	9	545
2 x 2.5", 2 x 4"	98.90	1	99
<b>Total Public Fire Hydrants</b>		<b>1,450</b>	<b>86,147</b>

<sup>6</sup> Total demand for fire connections is based on line diameter and will vary from potable demand, based on meter size.

<sup>7</sup> Hazen-Williams equation via AWWA M1 Manual

<sup>8</sup> Hazen-Williams equation via AWWA M1 Manual

Table 5-10 summarizes the equivalent potential demand through private fire connections (Table 5-8) and public hydrants (Table 5-9). The potential fire demand percentage, and therefore cost allocation to public and private fire (Column C), is calculated by dividing the equivalent potential demand (Line 1 or Line 2, column B) by the total potential demand (Line 3). Eighty-three percent of fire capacity, and therefore costs, relate to public fire and will be recovered on the bi-monthly fixed charges. The remaining seventeen percent is attributable to private fire service and recovered through private fire service charges.

**Table 5-10: Allocation of Private Fire Costs**

Line No.	Description	Equivalent Potential Demand	Percent of Total Demand
	(A)	(B)	(C)
1	Private Fire	17,352	17%
2	Public Fire	86,147	83%
3	<b>Total</b>	<b>103,499</b>	<b>100%</b>

This approach to allocating costs related to public fire service has been confirmed by SB 1386, which added section 53750.5 to the Government Code effective January 1, 2021.

## 5.6. Unit Cost Derivation

The end goal of a cost-of-service analysis is to distribute the revenue requirement to each customer class. Raftelis calculated unit costs for every component by assessing the total water demanded, meter count (number of accounts/bills), or equivalent service units. Table 5-11 shows the derivation of the unit cost. Projected FY 2022 water use was divided by 365 days to determine daily use (Column C & D). The max day and max hour capacities are calculated by multiplying the average daily use by the max day or max hour peaking factor. This results in the total capacity, with extra capacity calculated by subtracting the average daily use from the total capacity for the max day and by subtracting the total capacity for the max day from the total capacity for a max hour, respectively. The flow unit of HCF/Day is used for both max day and max hour calculations. The values shown are rounded to the nearest HCF. Column J summarizes the total number of equivalent meters or potential demand and customers for potable water (Table 5-7) and private fire (Table 5-8).

**Table 5-11: Derivation of Cost Causation Components Units of Service**

Line No.	Customer Class	Tier Width (hcf)	Annual Use (hcf)	Average Daily Usage (hcf)	Max Day			Max Hour			Equivalent Meters	Number of Customers	Number of Private Fire Customers	Number of Bi-monthly Bills
					Capacity Factor	Total Capacity (HCF/day)	Extra Capacity (HCF/day)	Capacity Factor	Total Capacity (HCF/day)	Extra Capacity (HCF/day)				
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)
1	<b>Single Family Residence</b>		<b>1,310,025</b>	<b>3,589</b>	<b>1.84</b>	<b>6,591</b>	<b>3,002</b>	<b>3.24</b>	<b>11,632</b>	<b>5,040</b>	<b>10,355</b>	<b>9,345</b>		
2	Tier 1	12	586,031	1,606	1.44	2,311	705	2.54	4,078	1,767	0	0		
3	Tier 2	20	249,915	685	1.74	1,191	506	3.07	2,101	910	0	0		
4	Tier 3	40	297,716	816	2.12	1,731	915	3.75	3,055	1,324	0	0		
5	Tier 4	>40	176,362	483	2.81	1,359	876	4.96	2,398	1,039	0	0		
6	<b>Single Family - Agriculture</b>		<b>16,726</b>	<b>46</b>	<b>2.25</b>	<b>103</b>	<b>57</b>	<b>3.96</b>	<b>182</b>	<b>79</b>	<b>81</b>	<b>23</b>		
7	Tier 1	12	1,977	5	1.44	8	2	2.54	14	6	0	0		
8	Tier 2	20	1,187	3	1.74	6	2	3.07	10	4	0	0		
9	Tier 3	40	2,620	7	2.12	15	8	3.75	27	12	0	0		
10	Tier 4	>40	10,942	30	2.48	74	44	4.37	131	57	0	0		
11	<b>Single Family - Commercial</b>		<b>1,807</b>	<b>5</b>	<b>1.86</b>	<b>9</b>	<b>4</b>	<b>3.29</b>	<b>16</b>	<b>7</b>	<b>14</b>	<b>9</b>		
12	Tier 1	12	738	2	1.44	3	1	2.54	5	2	0	0		
13	Tier 2	20	306	1	1.74	1	1	3.07	3	1	0	0		
14	Tier 3	40	324	1	2.12	2	1	3.75	3	1	0	0		
15	Tier 4	>40	439	1	2.48	3	2	4.37	5	2	0	0		
16	<b>Multi-family</b>		<b>482,126</b>	<b>1,321</b>	<b>1.69</b>	<b>2,239</b>	<b>918</b>	<b>2.99</b>	<b>3,951</b>	<b>1,712</b>	<b>2,879</b>	<b>1,713</b>		
17	Tier 1	8	315,788	865	1.44	1,245	380	2.54	2,197	952	0	0		
18	Tier 2	12	72,261	198	1.74	344	146	3.07	608	263	0	0		
19	Tier 3	16	39,987	110	2.12	232	123	3.75	410	178	0	0		
20	Tier 4	>16	54,089	148	2.81	417	269	4.96	735	319	0	0		
21	<b>Multi-family - Agriculture</b>		<b>8,799</b>	<b>24</b>	<b>2.39</b>	<b>58</b>	<b>33</b>	<b>4.21</b>	<b>102</b>	<b>44</b>	<b>16</b>	<b>5</b>		
22	Tier 1	8	498	1	1.44	2	1	2.54	3	2	0	0		
23	Tier 2	12	249	1	1.74	1	1	3.07	2	1	0	0		
24	Tier 3	16	233	1	2.12	1	1	3.75	2	1	0	0		
25	Tier 4	>16	7,820	21	2.48	53	32	4.37	94	41	0	0		
26	<b>Multi-family - Commercial</b>		<b>1,221</b>	<b>3</b>	<b>2.08</b>	<b>7</b>	<b>4</b>	<b>3.67</b>	<b>12</b>	<b>5</b>	<b>9</b>	<b>5</b>		
27	Tier 1	8	372	1	1.44	1	0	2.54	3	1	0	0		
28	Tier 2	12	97	0	1.74	0	0	3.07	1	0	0	0		
29	Tier 3	16	73	0	2.12	0	0	3.75	1	0	0	0		
30	Tier 4	>16	678	2	2.48	5	3	4.37	8	4	0	0		
31	<b>Ag/Commercial</b>	Uniform	306,515	840	1.98	1,450	610	2.94	2,467	1,108	1,424	593		
32	<b>Institutional</b>	Uniform	54,769	150	1.63	312	162	3.67	550	239	372	109		
33	<b>Landscaping</b>	Uniform	147,719	405	1.73	860	455	3.75	1,518	658	814	234		
34	<b>Construction</b>	Uniform	17,597	48	0.00	102	54	3.77	182	80	0	0		
35	<b>All Classes (No Fire)</b>	Uniform	0	0	2.11	0	0	0.00	0	0	0	0		72,216
36	<b>Fire Protection Meters</b>	Uniform	0	0	1.94	0	0	0.00	0	0	0	0	2,456	14,736
37	<b>Total</b>		<b>2,347,303</b>	<b>6,431</b>			<b>5,300</b>			<b>8,972</b>	<b>15,964</b>	<b>12,036</b>	<b>2,456</b>	<b>86,952</b>

Table 5-12 shows the calculated public and private fire service capacity. Line 1 shows that a typical fire lasts four hours, and the needed fire flow is 4,000 gallons per minute (GPM), as shown in Line 2. Line 4 shows the percentage of the District’s fire costs that are allocated to Public Fire (Table 5-10). Max day capacity demanded by fire protection (Line 5) is determined by converting 4,000 GPM to gallons per hour, then multiplying by the four-hour duration of a typical fire. This is converted to HCF per day in Line 5, Column B. A similar calculation is done for the max hour capacity, multiplying the max day capacity by 24 hours less the capacity already allocated to Max Day. This is converted to HCF per day in Line 5, Column C. Public Fire is allocated 83 percent of each of those capacities. The values for max day and max hour total extra capacity shown in Line 9 are calculated by adding the total fire service capacity in Line 8 to the respective max day and max hour extra capacities shown in Columns G and J of Table 5-11.

**Table 5-12: Calculation of Fire Service Capacity**

Line No.	Fire Estimate (A)	Max Day (B)	Max Hour (C)
1	<b>Hours for Typical Fire: 4</b>		
2	<b>Fireflow Required for Typical Fire: 4,000 (gallons per minute)</b>		
3			
4	<b>Cost to Public Fire</b>	83%	83%
5	Capacity Demanded for Fire (hcf/day)	1,283	6,417
6	Public Fire	1,068	5,341
7	Private Fire	215	1,076
8	<b>Total Fire</b>	<b>1,283</b>	<b>6,417</b>
9	<b>Total Extra Capacity - Fire and Potable (hcf/day)</b>	<b>6,584</b>	<b>15,389</b>

## 5.7. Final Allocation of Revenue Requirement to Cost Components

The COS can now be completed by making the final adjustments shown in Table 5-13. Line 4 is the result of the preliminary cost allocation to cost components in Table 5-6. Line 6 allocates General costs to all cost components except Recycled Water and Revenue Offset, based on the percentage of costs allocated in the preliminary cost of service (Line 5). Line 7 adjusts public fire peaking costs (Columns C & D) to potable meter capacity (Column E). The amount of peaking costs adjusted for public fire is calculated by multiplying the max day and max hour allocated costs in Line 4 and Line 6 by the max day and max hour extra capacity percentages<sup>9</sup>. Line 8 allocates costs from the max day and max hour (Column C & D) to private fire (Column J). The percentage of peaking costs allocated to private fire is calculated by multiplying the max day and max hour allocated costs on Line 4 and Line 6 by the percentage of private fire extra capacity<sup>10</sup>. Line 9 allocates a portion of max day and max hour costs to the meter component so that these costs can be collected through a fixed charge. This is so the District meets its revenue stability goals and collects a portion of capacity through a fixed charge. Line 10 allocates a portion of Customer Billing to private fire for billing associated costs since Private fire customers receive customer service and bills. The final adjusted COS allocation to the cost components is shown in Line 11.

<sup>9</sup> The max day and max hour percentage of extra capacity can be calculated dividing the extra capacity demanded by public fire (Line 6, Table 5-12) by the total extra capacity (Line 9, Table 5-12).

<sup>10</sup> The max day and max hour percentage of extra capacity can be calculated dividing the extra capacity demanded by private fire (Line 7, Table 5-12) by the total extra capacity (Line 9, Table 5-12).

Utilizing the final COS (Line 11) as the numerator and the units of service derived in Table 5-11 as the denominators (Line 12), we derive unit costs of service in Line 13. The total COS is divided by the respective units of service to calculate the unit cost of each cost component. Meter costs are divided by total meter equivalencies multiplied by six bi-monthly bills to determine a cost per equivalent meter in Table 5-7, and annual customer costs are divided by the estimated number of annual bi-monthly bills, from the number of meters in Table 5-7 and number of lines in Table 5-8. Fire protection costs are divided by total equivalent private fire demand from Table 5-8 to determine a cost per equivalent demand for private fire connections. The unit costs are used to distribute the cost components to service and commodity rates.

Once the District's expenses have been allocated to the cost causation components, rates are derived to collect the total amount shown in Column L of Table 5-13.

**Table 5-13: Final Cost of Service Allocation to Cost Components**

Line No.	Description (A)	Base (B)	Max Day (C)	Max Hour (D)	Meter Service / Capacity (E)	Customer Billing (F)	Conservation (G)	General (H)	Recycled Water (I)	Private Fire Meter (J)	Revenue Offset (K)	Total (L)
1	Operating Expenses	\$7,841,491	\$1,302,563	\$929,501	\$1,407,903	\$922,491	\$150,173	\$2,824,003	\$838,520	\$59,542	\$0	\$16,276,186
2	Capital Expenses	\$1,517,454	\$735,668	\$768,803	\$99,722	\$0	\$0	\$0	\$0	\$0	\$0	\$3,121,647
3	Revenue Offsets	(\$682,548)	(\$145,338)	(\$119,826)	(\$111,133)	(\$68,499)	(\$11,151)	(\$209,695)	\$0	(\$4,421)	(\$540,800)	(\$1,893,411)
4	<b>Total Cost of Service</b>	<b>\$8,676,398</b>	<b>\$1,892,893</b>	<b>\$1,578,478</b>	<b>\$1,396,491</b>	<b>\$853,992</b>	<b>\$139,022</b>	<b>\$2,614,308</b>	<b>\$838,520</b>	<b>\$55,121</b>	<b>(\$540,800)</b>	<b>\$17,504,422</b>
5	Allocation of General Cost %	59%	13%	11%	10%	6%	1%	0%	0%	0%	0%	100%
6	Allocation of General Cost	\$1,554,425	\$339,122	\$282,793	\$250,189	\$152,997	\$24,907	(\$2,614,308)	\$0	\$9,875	\$0	(\$0)
7	Allocation of Public Fire to Meter	\$0	(\$362,138)	(\$645,980)	\$1,008,118	\$0	\$0	\$0	\$0	\$0	\$0	\$0
8	Allocation to Private Fire	\$0	(\$72,942)	(\$130,113)	\$0	\$0	\$0	\$0	\$0	\$203,055	\$0	\$0
9	Allocation Peak to Meter	\$0	(\$341,418)	(\$206,184)	\$547,601	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10	Allocation of Customer Bills to Private Fire	\$0	\$0	\$0	\$0	(\$45,315)	\$0	\$0	\$0	\$45,315	\$0	\$0
11	<b>Adjusted Cost of Service</b>	<b>\$10,230,823</b>	<b>\$1,455,518</b>	<b>\$878,994</b>	<b>\$3,202,400</b>	<b>\$961,675</b>	<b>\$163,928</b>	<b>\$0</b>	<b>\$838,520</b>	<b>\$313,365</b>	<b>(\$540,800)</b>	<b>\$17,504,422</b>
12	Units of Service	2,347,303	5,300	8,972	95,781	72,216	1,939,869			17,352	2,127,218	
13	<b>Unit</b>	hcf	hcf/day	hcf/day	Eq Meters/Year	Customer Bills	Conservation hcf			Equivalent Demand	hcf	
14	<b>Unit Cost</b>	\$4.36	\$274.61	\$97.97	\$33.43	\$13.32	\$0.08					
15	<b>Unit</b>	\$/hcf	hcf/day	hcf/day	equi. Line/month	\$/bill	\$/hcf					

# 6. Potable Water Rate Design

This section calculates potable water rates based on the Cost of Service (Section 5). The rates developed in this section will be referred to as the Cost of Service rates.

## 6.1. Existing Rate Structure and Rates

The District’s current rate structure has a fixed and variable component for all customers. The fixed service charge is comprised of a bi-monthly Meter Service Charge, a San Diego County Water Authority (SDCWA) Infrastructure Access Charge (IAC), and Fire Line Service Charge. The Fire Line Service Charge is only for those customers with private fire protection connections. The variable rates for water consumption are tiered commodity charges for residential customer classes and uniform commodity charges for non-residential customer classes. Table 6-1 shows the current fixed service charges. Table 6-2 shows the current commodity rate per hundred cubic feet (HCF)<sup>11</sup>.

**Table 6-1: Current Potable Bi-Monthly Fixed Charges**

Meter Size	Water Meter Service Charge	SDCWA Infrastructure Access Charge	Fire Line / Meter Service Charge
Effective Date	6/1/2020	1/1/2021	6/1/2020
5/8"	\$45.16	\$8.48	\$9.61
3/4"	\$45.16	\$8.48	\$9.61
1"	\$66.50	\$13.57	\$9.61
1.5"	\$119.37	\$25.43	\$10.83
2"	\$183.06	\$44.07	\$18.88
3"	\$331.78	\$81.38	\$47.77
4"	\$544.61	\$139.00	\$97.59
6"	\$1,074.78	\$254.30	\$276.40
8"	\$1,711.73	\$440.78	\$584.82

<sup>11</sup> One hundred cubic foot is equivalent to 748 gallons.

**Table 6-2: Current Potable Commodity Rates**

<b>Class</b>	<b>Tier</b>	<b>Tier Width</b>	<b>Rate (\$/HCF)</b>
<b>Effective Date</b>			<b>6/1/2020</b>
<b>SFR</b>	Tier 1	12	\$3.19
	Tier 2	20	\$5.06
	Tier 3	40	\$6.25
	Tier 4	>40	\$7.12
<b>SFR -w- Agricultural</b>	Tier 1	12	\$3.19
	Tier 2	20	\$5.06
	Tier 3	40	\$6.25
	Tier 4	>40	\$6.25
<b>SFR -w- Commercial</b>	Tier 1	12	\$3.19
	Tier 2	20	\$5.06
	Tier 3	40	\$6.25
	Tier 4	>40	\$6.25
<b>Multi-Family Residence (MFR)</b>	Tier 1	8	\$3.19
	Tier 2	12	\$5.06
	Tier 3	16	\$6.25
	Tier 4	>16	\$7.12
<b>MFR -w- Agriculture</b>	Tier 1	8	\$3.19
	Tier 2	12	\$5.06
	Tier 3	16	\$6.25
	Tier 4	>16	\$6.25
<b>MFR -w- Commercial</b>	Tier 1	8	\$3.19
	Tier 2	12	\$5.06
	Tier 3	16	\$6.25
	Tier 4	>16	\$6.25
<b>Agriculture</b>	Uniform		\$5.42
<b>Commercial</b>	Uniform		\$5.42
<b>Public</b>	Uniform		\$5.93
<b>Government</b>	Uniform		\$5.93
<b>Landscaping</b>	Uniform		\$6.25
<b>Construction</b>	Uniform		\$6.36

## 6.2. Bi-Monthly Water Meter Service Charge

Raftelis proposes that the District retain its bi-monthly water meter fixed charge by meter size for potable water. There are two cost components that comprise the total proposed bi-monthly fixed charge:

1. Customer Billing
2. Meter Service & Capacity.

The Customer Billing component recovers costs associated with meter reading, customer billing, as well as customer service costs. These costs are the same for all meter sizes as it costs the District the same to provide billing and customer services to any account, regardless of meter size. The Meter Service / Capacity cost component recognizes

the fact that the District incurs fixed costs related to maintaining/replacing meters. These costs generally increase with meter size increases, as it takes less time and resources to repair and maintain smaller meters compared to a larger meter. Table 6-3 shows the derivation of the components for the base meter size (3/4-inch).

**Table 6-3: Derivation of Bi-Monthly Fixed Water Meter Service Charge**

Line No.	Description	Charge Basis
1	<b>Customer Service Charge Component</b>	Per Account
2	Customer Service Costs	\$961,675
3	Number of Annual Bills	72,216
4	<b>Bi-monthly Customer Service Charge</b>	<b>\$13.32</b>
5		
6	<b>Meter Service + Capacity</b>	Per Equivalent Meter
7	Meter Service + Capacity Costs	\$3,202,400
8	Number of Equivalent Meters	95,781
9	<b>Bi-monthly Meter Service</b>	<b>\$33.43</b>

Table 6-4 shows the calculation of the total bi-monthly fixed charge for each meter size. The Meter Service/Capacity component is based on the number of equivalent meters for each meter size. It reflects the fact that larger meters have the potential to demand more capacity compared to smaller meters. The potential capacity demanded is proportional to the potential flow through each meter size as established by the AWWA hydraulic capacity ratios, shown in Column C. The ratios show the potential flow through each meter size compared to the flow through a 3/4-inch meter. The meter service component for larger meters shown are calculated by multiplying the capacity ratio by the bimonthly meter service charge, derived in Table 6-3. Meter Service and Capacity (Column E) is calculated by multiplying the capacity ratio by the bi-monthly potable meter capacity charge, as derived in Line 9 of Table 6-3. Allocating capacity costs by meter size is a common way to recover the fixed costs and increase revenue stability. The Customer Billing and Meter Service / Capacity components are combined to yield the total proposed fixed charge by meter size.

**Table 6-4: Calculation of Bi-Monthly Fixed Water Meter Charge**

Line No.	Meter Size	Number of Accounts (Potable)	Meter Ratio	Meter Service and Capacity	Customer Billing	Proposed Bi-Monthly Service Charge
	(A)	(B)	(C)	(D)	(E)	(F)
1	5/8"	3,673	1.00	\$33.43	\$13.32	\$46.75
2	3/4"	5,995	1.00	\$33.43	\$13.32	\$46.75
3	1"	1,519	1.67	\$55.84	\$13.32	\$69.15
4	1.5"	429	3.33	\$111.34	\$13.32	\$124.65
5	2"	414	5.33	\$178.21	\$13.32	\$191.52
6	3"	2	10.00	\$334.35	\$13.32	\$347.66
7	4"	3	16.67	\$557.35	\$13.32	\$570.67
8	6"	0	33.33	\$1,114.38	\$13.32	\$1,127.69
9	8"	1	53.33	\$1,783.07	\$13.32	\$1,796.38

### 6.3. Private Fire

Private Fire bi-monthly fixed charges are composed of three cost components: Meter Maintenance, Billing & Customer Service, and the Fire Capacity Costs components. The Meter Maintenance cost component recovers fixed costs related to reading, maintaining, and replacing the ¾-inch and 1-inch fire meters. Meter maintenance costs generally increase with meter size, as it takes less time and resources to repair and maintain smaller meters compared to a larger meter. The Customer Billing component recovers costs associated with meter reading and customer billing. These costs are the same for all meter sizes as it costs the District the same to provide billing and customer services to Private Fire accounts, regardless of fire line meter size.

Table 6-5 shows the derivation of the private fire rate components. Lines 2 - 4 show the fire meter maintenance charge for the customers with fire meters. This accounts for the expense of reading and repairs to the meter. The charge (Line 4) can be calculated by dividing the amount allocated<sup>12</sup> to private fire, including the General reallocation in the COS (Line 2), by the total amount of fire meters (Line 3). Lines 7 – 9 show the calculation of the Billing/Customer Service charge component. The Billing Customer Service charge component (Line 9) is calculated by dividing the amount allocated<sup>13</sup> to private fire from Customer Billing (Line 7) by the number of annual fire bills (Line 8). Lines 12 – 14 show the calculation of the Fire Fighting Capacity charge component. The charge (Line 14) is calculated by dividing the amount allocated<sup>14</sup> to private fire for firefighting capacity from Peaking (Line 12) by the equivalent potential demand (Line 13 & Table 5-8). Line 16 shows the total amount collected through all charges for fire protection.<sup>15</sup>

**Table 6-5: Calculation of Private Fire Charges**

Line No.	Description	Charge Basis
1	<b>Meter Maintenance</b>	Per Fire Meter
2	Cost to Maintain Private Fire Meters	\$64,996
3	Number of Fire Meters	2,262
4	<b>Bi-Monthly Fire Meter Maintenance</b>	<b>\$4.79</b>
5		
6	<b>Billing/Customer Service</b>	Per Bill
7	Costs to Bill Private Fire Customers	\$45,315
8	Number of Fire Bills (Annual):	14,736
9	<b>Bi-Monthly Billing Component</b>	<b>\$3.08</b>
10		
11	<b>Fire Fighting Capacity</b>	Per Equivalent Demand
12	Fire Capacity Costs	\$203,055
13	Equivalent Potential Demand (Private Fire):	2,892
14	<b>Fire Fighting Capacity Component</b>	<b>\$1.95</b>
15		
16	<b>Total Private Fire Costs</b>	<b>\$313,365</b>

<sup>12</sup> The allocation to Private Fire Meter from the Cost of Service and General Allocation is found in Line 4 and Line 6 of Table 5-13.

<sup>13</sup> The allocation to Private Fire Meter from Customer Billing is found in Line 10 of Table 5-13.

<sup>14</sup> The allocation to Private Fire Meter from Peaking is found in Line 8 of Table 5-13.

<sup>15</sup> The total Private Fire Costs allocated in the COS are found in Line 11 of Table 5-13.

Table 6-6 shows the calculation of the total bi-monthly private fire charge for each private fire connection size. The total proposed private fire charge connection size is calculated by combining the Meter Maintenance, Billing/Customer Service, and firefighting capacity costs. The Meter Maintenance component (Line 4, Table 6-5) applies to 1” compound meter customers. It reflects the fact that Private Fire customers with fire meters have periodic maintenance performed on the meter. The Customer Billing component (Line 9, Table 6-5) applies uniformly to all private fire customers. Firefighting capacity costs are proportional to the potential flow through each private fire line or size (Column B), shown in Table 5-8. The firefighting capacity costs are calculated by multiplying the capacity ratio (Column C) by the bimonthly firefighting capacity cost (Line 14, Table 6-5).

**Table 6-6: Derivation of Private Fire Rates**

Line No.	Meter Size/Line Diameter	Number of Accounts	Fire Demand Ratio	Equivalent Demand	Private Fire Protection Component	Bi-Monthly Billing Component	Bi-Monthly Fire Meter Maintenance	Proposed Rates
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
1	1"	2,262	1.00	2,262	\$1.95	\$3.08	\$4.79	\$9.81
2	1.5"	1	2.90	3	\$5.67	\$3.08	\$0.00	\$8.74
3	2"	23	6.19	142	\$12.07	\$3.08	\$0.00	\$15.15
4	3"	0	17.98	0	\$35.07	\$3.08	\$0.00	\$38.15
5	4"	89	38.32	3,410	\$74.74	\$3.08	\$0.00	\$77.81
6	6"	61	111.31	6,790	\$217.10	\$3.08	\$0.00	\$220.17
7	8"	20	237.21	4,744	\$462.64	\$3.08	\$0.00	\$465.72

## 6.4. Commodity Rates (\$/HCF)

Raftelis proposes that the District retain its commodity rate structure and tier breakpoints. The District has a tiered commodity rate for residential customers and a uniform commodity rate for non-residential customers. The commodity rate has five cost components:

1. Water Supply
2. Delivery
3. Peaking
4. Conservation
5. Revenue Offset.

**Water Supply costs** are costs associated with obtaining and treating water to make it ready for transmission and distribution. The District has three sources of water; local water from Lake Hodges<sup>16</sup> (local raw), SDCWA imported treated, and SDCWA imported untreated.

**Delivery costs** are the operating and capital costs associated with delivering water to all customers at a constant average rate of use – also known as serving customers under average daily demand conditions. Therefore, delivery costs are spread over all units of water which results in equal delivery unit costs for all classes and tiers.

**Peaking costs**, or extra-capacity costs, represent costs incurred to meet customer peak demands in excess of a base use (or in excess of average daily demand). Total extra capacity costs are comprised of maximum day and maximum hour demands, as discussed in Section 5. For the portion of extra capacity costs collected through the commodity

<sup>16</sup> The District jointly retains water rights to the surface water stored in Lake Hodges with the Sante Fe Irrigation District and the City of San Diego.

rate, peaking costs are distributed to each tier and class using peaking factors derived from customer use data – this is shown in columns 2 and 3 in Table 5-8. For the portion of extra capacity costs collected through the fixed charge, AWWA hydraulic capacity factors are used to distribute extra capacity costs to customer classes – this is shown in Column B of Table 5-7.

**Conservation costs** are costs that cover water conservation and efficiency programs and efforts. These programs are targeted at high-volume water users. Therefore, conservation costs were allocated to Tier 4, for which conservation programs are designed to promote water efficiency. Allocation of conservation costs to upper tiers helps provide a strong price signal for conservation, consistent with Article X Section 2 of the State of California Constitution, and proportionately allocates such costs to those customers whose greater demand creates the need for conservation and efficiency programs and efforts.

**Revenue Offset** is a cost component that applies a credit that applies a portion of property tax revenue to reduce the rates to promote affordability for Tiers 1 and 2 as well as the Commercial class. The District has discretion on how to use this non-rate revenue.

### 6.4.1. UNIT COST DERIVATION

Water Supply costs are associated with obtaining and treating water to make it ready for delivery. Base Costs are the operating and capital costs associated with delivering water to all customers through the distribution system (not including distribution storage) at a constant average rate of use, also known as serving customers under average daily demand conditions (base use). Table 6-7 shows the Base Rate unit cost in dollars per HCF.

**Table 6-7: Calculation of Base Rate Unit Cost**

Line No.	Water Supply Unit Cost	
1	Base Cost	\$10,230,823
2	Water Use (hcf)	2,347,303
3	<b>Unit Cost (\$/hcf)</b>	<b>\$4.36</b>

The supply rate for each tier and class is a function of the cost and amount of water allocated from each of the District’s water sources. Table 6-8 shows the estimated volume purchased and sold (Table 2-5)<sup>17</sup> from each water source.

**Table 6-8: Annual Water Use, Water Purchased, and Total Costs by Source**

Line No.	Description	Imported Treated	Imported Raw	Local Raw (Lake Hodges)	Total
1	Volume Purchased (AF)	249	3,315	2,135	5,699
2	Volume Purchased (HCF)	108,464	1,444,147	930,006	2,482,617
3	Percent From Each Source	4%	58%	37%	100%
4	Annual Use (AF)	235	3,135	2,019	5,389
5	Annual Use (HCF)	102,553	1,365,434	879,316	2,347,303
6	Water Purchase Costs	\$349,894	\$3,676,777	\$157,000	\$4,183,671
7	Percent of Water Purchase Costs	8%	88%	4%	100%

<sup>17</sup> Water loss is considered for purchase water required to meet demand (water use), shown in Table 2-3.

Table 6-9 shows the unit cost per acre-foot to treat raw water<sup>18</sup> at the R.E. Badger Filtration Plant<sup>19</sup>. The unit cost is calculated by dividing the projected test year water treatment costs by the total volume of untreated water from all District water sources.

**Table 6-9: Cost to Treat Surface Water**

Line No.	Description	
1	Water Treatment Costs	\$2,966,311
2	Untreated Water (AF Imported)	3,315
3	Untreated Water (AF Local)	2,135
4	<b>Total Untreated Water - AF</b>	<b>5,450</b>
5	<b>Estimated Cost to Treat Untreated Water (\$/AF)</b>	<b>\$544.25</b>

The SDCWA imported water rates for treated and untreated water are updated on a calendar year (CY) basis. Table 6-10 shows the weighted average rate for FY 2022. Analysis of the District’s customers’ actual water use in FY 2019 and FY 2020 shows roughly 60% and 40% of water use occur in the first and second half of a fiscal year, respectively. The weighted average rate for imported treated water, weighed by seasonal water use, is shown in Line 6. Similarly, the weighted average rate for imported raw water is shown in Line 7.

**Table 6-10: Estimated Imported Water Rate**

Line No.	Description	CY 2021 Rate	CY 2022 Rate
1	Months Effective	July-December	January-June
2	Percentage of Water Use	60%	40%
3	Imported Treated	\$1,385	\$1,436
4	Imported Raw	\$1,090	\$1,138
5			
6	<b>Weighted Average Imported Treated Rate</b>		<b>\$1,405</b>
7	<b>Weighted Average Imported Raw Rate</b>		<b>\$1,109</b>

Table 6-11 shows the total water supply cost purchased from each water source. Imported treated water (Line 1) does not require additional treatment costs. Line 5 and Line 9 show the total supply cost of imported raw and local raw water, including the additional cost of treatment (Table 6-9). This accounts for the treatment the raw water must undergo before being provided to District’s customers.

<sup>18</sup>The FY 2022 Projected Treatment Costs are found in Table 4-1.

<sup>19</sup> The R.E. Badger Filtration Plant is co-owned by the District and Santa Fe Irrigation System.

**Table 6-11: Supply Costs By Source**

Line No.	Description	FY 2022
1	<b>Imported Treated Water Rate (Treated M&amp;I Rate)</b>	<b>\$1,405</b>
2		
3	Imported Raw Water Rate (Untreated Rate)	\$1,109
4	Cost to Treat Imported Untreated M&I Water	\$544
5	<b>Cost to Obtain and Treat Untreated Imported Raw Water</b>	<b>\$1,653</b>
6		
7	Local Raw Water (\$/AF)	\$74
8	Cost to Treat Lake Hodges Water (\$/ AF)	\$544
9	<b>Cost to Obtain and Treat Local Raw Water (\$/AF)</b>	<b>\$618</b>

Table 6-12 shows the total cost of water produced by source. Line 1 and Line 2 are the calculated supply and treatment costs (Table 6-11) per AF and HCF, respectively. Line 3 shows the supply cost accounting for lost water<sup>20</sup>. Line 5 and Line 6 show the projected amount of water that will be purchased in FY 2022 (Table 6-8). Line 8 shows the total cost of water produced, calculated by multiplying the cost of water (Line 6) by the projected water purchase amount (Line 3).

**Table 6-12: Total Cost of Water Produced**

Line No.	Description	Imported Treated Water	Treated Imported Raw Water	Treated Local Raw Water	Total
1	Cost of Water Produced (\$/AF)	\$1,405	\$1,653	\$618	
2	Cost of Water Produced (\$/HCF)	\$3.23	\$3.80	\$1.42	
3	Cost Accounting for Lost Water (\$/hcf)	\$3.41	\$4.01	\$1.50	
4					
5	Water Purchased (AF)	249	3,315	2,135	5,699
6	Water Purchased (HCF)	108,464	1,444,147	930,006	2,482,617
7					
8	<b>Total Cost of Water Produced</b>	<b>\$349,894</b>	<b>\$5,481,121</b>	<b>\$1,318,967</b>	<b>\$7,149,983</b>

Table 6-13 shows the number of accounts and percentage distribution of accounts in each customer class for FY 2022.

<sup>20</sup> This cost accounting for lost water maintains the water loss assumptions shown in Table 2-3.

**Table 6-13: Customer Account Distribution**

Line No.	Description	Number of Accounts	% of Accounts
1	Single Family Residence	9,345	78%
2	Single Family - Agriculture	23	0%
3	Single Family - Commercial	9	0%
4	Multi-family	1,713	14%
5	Multi-family - Agriculture	5	0%
6	Multi-family - Commercial	5	0%
	<b>Subtotal</b>		<b>92%</b>
7	Ag/Commercial	593	5%
8	Institutional	109	1%
9	Landscaping	234	2%
10	Construction	0	0%
11	All Classes (No Fire)	0	0%
12	<b>Total</b>	<b>12,036</b>	<b>100%</b>

Table 6-14 shows the source and total volume of water allocated to each class in proportion to the number of accounts by class (Table 6-13).

**Table 6-14: Use By Source Distributed by Customer Accounts**

Line No.	Description	Treated Local Raw Water	Imported Water	Treated Imported Raw Water	Total Water
1	Residential	810,936	94,578	1,259,251	2,164,764
2	Ag/Commercial	43,322	5,053	67,272	115,647
3	Institutional	7,963	929	12,365	21,257
4	Landscaping	17,095	1,994	26,546	45,635
5	Construction	0	0	0	0
6	<b>Total</b>	<b>879,316</b>	<b>102,553</b>	<b>1,365,434</b>	<b>2,347,303</b>

Table 6-15 shows the average supply cost by class. Line 1 shows the water supply cost, accounting for water loss (from Table 6-12). The average supply cost for each customer class is calculated by the weighted average - weighted by the use from each source - of the supply cost for each source. The average supply, in column F, can be calculated by adding the total supply costs<sup>21</sup> and dividing by the total use in each class (Column E). Column F shows the average supply cost for each class used to derive rates for each class. The average cost of water supply for all classes is shown in Line 8 – though this is only used in Table 6-20

<sup>21</sup> For example, the total supply costs for Residential customers is calculated by multiplying the amount of water from each source, shown in Line 3, Columns B, C, & D, and unit costs shown in Line 1, Columns B, C, & D.

**Table 6-15: Calculation of Supply Costs by Class**

Line No.	Description	Treated Local Raw Water (B)	Imported Treated Water (C)	Treated Imported Raw Water (D)	Total Use By Class (HCF) (E)	Average Supply Cost (F)
1	Water Supply Cost (\$/HCF)	\$1.50	\$3.41	\$4.01		
2						
3	Residential (Single & Multi Family)	810,936	94,578	915,190	1,820,703	\$2.86
4	Ag/Commercial	43,322	5,053	258,140	306,515	\$3.65
5	Institutional	7,963	929	45,877	54,769	\$3.64
6	Landscaping	17,095	1,994	128,630	147,719	\$3.72
7	Construction	0	0	17,597	17,597	\$4.01
8	<b>Total</b>	<b>879,316</b>	<b>102,553</b>	<b>1,365,434</b>	<b>2,347,303</b>	<b>\$3.05</b>

Table 6-16 shows the calculation of the supply unit cost for each residential tier (Column I). The water allocated to the residential class (line 3 of Table 6-15) is allocated to each tier as shown in column H. Tier 1 (line 1) is allocated local water. Tier 2 (line 3) is allocated the remaining amount of imported treated water and imported untreated water in that order to meet its water demand. Tiers 3 and 4 (lines 3 and 4) are allocated solely imported treated water. The weighted average supply cost by tier (Column I) is calculated by taking the weighted average of the supply cost by source (Line 7 & Table 6-12), weighted by the use in each tier to produce the average supply cost by tier. The average supply cost for the residential class as a whole, shown in the bottom right corner, is the same as the residential-class average supply cost Table 6-15.

**Table 6-16: Calculation of Supply Costs by Residential Tier**

Total Water Supply By Source (HCF)									
Line No.	Tier	Bi-Monthly Break Point	% of Use	Use By Tier (HCF) (D)	Treated Local Raw Water (E)	Imported Treated Water (F)	Treated Imported Raw Water (G)	Total (H)	Average Supply Costs (I)
1	Tier 1	12	50%	905,404	810,936	94,468	0	905,404	\$1.70
2	Tier 2	20	18%	324,016	0	109	323,907	324,016	\$4.01
3	Tier 3	40	19%	340,953	0	0	340,953	340,953	\$4.01
4	Tier 4	>40	14%	250,330	0	0	250,330	250,330	\$4.01
5	<b>Total</b>		<b>100%</b>	<b>1,820,703</b>	<b>810,936</b>	<b>94,578</b>	<b>915,190</b>	<b>1,820,703</b>	<b>\$2.86</b>
6									
7	<b>Average Supply Cost By Water Source (\$/HCF)</b>					<b>\$1.50</b>	<b>\$3.41</b>	<b>\$4.01</b>	<b>\$2.86</b>

### 6.4.2. DELIVERY UNIT COSTS

Delivery costs are spread over all units of water, which results in an equal delivery unit cost for all classes and tiers. Table 6-17 shows the delivery unit cost. The delivery unit cost is calculated by subtracting the weighted average water supply rate (Table 6-15) from the Base Rate (Table 6-7). The base rate is the cost to obtain, treat and deliver water under average daily demand conditions. By subtracting the average supply rate, we identify the cost to deliver water under the same conditions.

**Table 6-17: Calculation of Delivery Unit Cost**

Line No.	Description	
1	Base Rate - COS	\$4.36
2	Average Supply & Treatment Cost	\$3.05
3	<b>Delivery Cost (\$/HCF)</b>	<b>\$1.31</b>

### 6.4.3. PEAKING UNIT COSTS

Table 6-18 shows the derivation of the unit peaking costs for all classes. The peaking costs in Column D are derived in Section 5.<sup>22</sup> The peaking rate is calculated by dividing the peaking costs (Column D) by the use (Column E) for each class and tier<sup>23</sup>.

**Table 6-18: Calculation of Peaking Factor Unit Cost**

Line No.	Class/Tier (A)	Tier Breakpoint (B)	Peaking Factor (C)	Peaking Costs (D)	Use (hcf) (E)	Peaking Rates (\$/hcf) (F)
1	<b>Single Family Residence</b>					
2	Tier 1	12	1.05	\$366,811	586,031	\$0.63
3	Tier 2	20	1.27	\$228,126	249,915	\$0.91
4	Tier 3	40	1.55	\$381,049	297,716	\$1.28
5	Tier 4	>40	2.05	\$342,272	176,362	\$1.94
6	<b>Single Family - Agriculture</b>					
7	Tier 1	12	1.05	\$1,237	1,977	\$0.63
8	Tier 2	20	1.27	\$1,084	1,187	\$0.91
9	Tier 3	40	1.55	\$3,353	2,620	\$1.28
10	Tier 4	>40	1.81	\$17,726	10,942	\$1.62
11	<b>Single Family - Commercial</b>					
12	Tier 1	12	1.05	\$462	738	\$0.63
13	Tier 2	20	1.27	\$279	306	\$0.91
14	Tier 3	40	1.55	\$415	324	\$1.28
15	Tier 4	>40	1.81	\$711	439	\$1.62
16	<b>Multi-family</b>					
17	Tier 1	8	1.05	\$197,660	315,788	\$0.63
18	Tier 2	12	1.27	\$65,961	72,261	\$0.91
19	Tier 3	16	1.55	\$51,180	39,987	\$1.28
20	Tier 4	>16	2.05	\$104,973	54,089	\$1.94
21	<b>Multi-family - Agriculture</b>					
22	Tier 1	8	1.05	\$312	498	\$0.63
23	Tier 2	12	1.27	\$227	249	\$0.91
24	Tier 3	16	1.55	\$298	233	\$1.28
25	Tier 4	>16	1.81	\$12,669	7,820	\$1.62
26	<b>Multi-family - Commercial</b>					
27	Tier 1	8	1.05	\$233	372	\$0.63
28	Tier 2	12	1.27	\$88	97	\$0.91
29	Tier 3	16	1.55	\$94	73	\$1.28
30	Tier 4	>16	1.81	\$1,099	678	\$1.62
31	<b>Commercial/AG</b>	Uniform	<b>1.26</b>	\$276,037	306,515	\$0.90
32	<b>Institutional</b>	Uniform	<b>1.52</b>	\$68,020	54,769	\$1.24
33	<b>Landscaping</b>	Uniform	1.55	\$189,453	147,719	\$1.28
34	<b>Construction</b>	Uniform	1.56	\$22,683	17,597	\$1.29
35	<b>Total</b>			<b>\$2,334,512</b>	<b>2,347,303</b>	

### 6.4.4. CONSERVATION UNIT COSTS

Table 6-19 shows the calculation of the conservation unit costs by class and tier. The conservation rate component is calculated by dividing the allocated conservation cost by customer class usage in the higher tiers. The District concentrates conservation efforts on Residential Tier 4 users and the Landscape customer class. District Staff

<sup>22</sup> The peaking costs are the sum of the Max Day and Max Hour costs for each class and tier.

<sup>23</sup> Peaking rates are correlated with the peaking factor – a higher peaking factor correlates to a higher peaking rate.

provided “Time and Resources” percentages which are used as the conservation costs<sup>24</sup> allocation basis between Residential and Landscape customers. Allocation of conservation costs to upper tiers helps provide a price signal for conservation, consistent with Article X Section 2 of the State of California Constitution. It proportionately allocates such costs to those customers whose greater demand creates the need for conservation and efficiency programs and efforts. The remaining classes are not allocated conservation costs since the District does not focus on reducing their water use, and therefore, these classes do not have a conservation rate.

**Table 6-19: Conservation Unit Cost**

Line No.	Class/Tier	% of Time and Resources	Allocated Conservation Cost	Use (hcf)	Conservation Rates (\$/hcf)
(A)	(B)	(C)	(D)	(E)	(F)
1	Residential - Tier 4	84%	\$137,700	230,451	\$0.60
2	Landscape	16%	\$26,229	147,719	\$0.18
3	<b>Total</b>		<b>\$163,928</b>	<b>378,170</b>	

### 6.4.5. REVENUE OFFSET UNIT COST

Table 6-20 shows the calculation of the revenue offsets to specific classes and tiers. As mentioned in Sections 5.2 and 5.3, half of the District’s property tax revenue was allocated specifically to tiers 1 and 2 and the Commercial (which comprises the former Agricultural and Commercial classes) class. The District has discretion on how to use property tax as non-rate revenue and has chosen to apply a portion of it to reduce the rates to promote affordability for Residential tiers 1 and 2 and the Commercial class. The residential revenue offset is allocated to a tier based on water use in tier 1 and tier 2. The commercial class revenue offset is calculated by dividing the allocated revenue offset (Column C) by the class use (Column 4). The Institutional customer class does not receive a revenue offset since public/government customers do not pay property tax and should not receive associated revenue offset benefits.<sup>25</sup>

**Table 6-20: Derivation of the Revenue Offset**

Line No.	Class/Tier	Tier Breakpoint	Revenue Offset	Allocation Factor	Use (hcf)	Weighted Allocation Factor	Percent Allocation of Property Tax to Each Tier	Allocated Revenue Offset	Revenue Offset (\$/hcf)
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	
<b>1 Residential Classes (SFR &amp; MFR)</b>									
2	Tier 1		(\$230,180)	1.00	905,404	905,404	74%	(\$340,884)	(\$0.38)
3	Tier 2		(\$82,374)	1.00	324,016	324,016	26%	(\$121,992)	(\$0.38)
4	Tier 3		(\$86,680)	0.00	340,953	0	0%	\$0	\$0.00
5	Tier 4		(\$63,641)	0.00	250,330	0	0%	\$0	\$0.00
6	<b>Total Residential Classes</b>		<b>(\$462,875)</b>		<b>1,820,703</b>	<b>1,229,420</b>	<b>0</b>	<b>(\$462,875)</b>	
7	Commercial/AG	Uniform	(\$77,925)	1.00	306,515	306,515	0	0	(\$0.25)
8	Institutional	Uniform	\$0	0.00	54,769				\$0.00
9	Landscaping	Uniform	\$0	0.00	147,719				\$0.00
10	Construction	Uniform	\$0	0.00	17,597				\$0.00
11	<b>Total</b>	<b>0</b>	<b>(\$540,800)</b>		<b>2,347,303</b>				

### 6.4.6. FINAL RATE DERIVATION

Table 6-21 shows the final rates for the commodity rate derivation by summing each unit cost to the total rate for each tier and class is shown in Column I.

<sup>24</sup> The total conservation costs were derived in Table 5-13.

<sup>25</sup> The property tax revenue that was allocated to the Institutional (Public/Government) class based on flow in Table 5-8 was reallocated to the Commercial class.

Table 6-21: Derivation of Rates by Tier and Class

Line No.	Class/Tier	Tier Breakpoint	Peaking Factors	Delivery (\$/HCF)	Peaking (\$/HCF)	Conservation (\$/HCF)	Revenue Offset (\$/HCF)	Total Proposed Rate (\$/HCF)
	(A)	(B)	(C)	(E)	(F)	(G)	(H)	(I)
1	<b>Single Family Residence</b>							
2	Tier 1	12	1.05	\$1.31	\$0.63	\$0.00	(\$0.38)	\$3.26
3	Tier 2	20	1.27	\$1.31	\$0.91	\$0.00	(\$0.38)	\$5.86
4	Tier 3	40	1.55	\$1.31	\$1.28	\$0.00	\$0.00	\$6.61
5	Tier 4	>40	2.05	\$1.31	\$1.94	\$0.60	\$0.00	\$7.86
6	<b>Single Family - Agriculture</b>							
7	Tier 1	12	1.05	\$1.31	\$0.63	\$0.00	(\$0.38)	\$3.26
8	Tier 2	20	1.27	\$1.31	\$0.91	\$0.00	(\$0.38)	\$5.86
9	Tier 3	40	1.55	\$1.31	\$1.28	\$0.00	\$0.00	\$6.61
10	Tier 4	>40	1.81	\$1.31	\$1.62	\$0.00	\$0.00	\$6.95
11	<b>Single Family - Commercial</b>							
12	Tier 1	12	1.05	\$1.31	\$0.63	\$0.00	(\$0.38)	\$3.26
13	Tier 2	20	1.27	\$1.31	\$0.91	\$0.00	(\$0.38)	\$5.86
14	Tier 3	40	1.55	\$1.31	\$1.28	\$0.00	\$0.00	\$6.61
15	Tier 4	>40	1.81	\$1.31	\$1.62	\$0.00	\$0.00	\$6.95
16	<b>Multi-family</b>							
17	Tier 1	8	1.05	\$1.31	\$0.63	\$0.00	(\$0.38)	\$3.26
18	Tier 2	12	1.27	\$1.31	\$0.91	\$0.00	(\$0.38)	\$5.86
19	Tier 3	16	1.55	\$1.31	\$1.28	\$0.00	\$0.00	\$6.61
20	Tier 4	>16	2.05	\$1.31	\$1.94	\$0.60	\$0.00	\$7.86
21	<b>Multi-family - Agriculture</b>							
22	Tier 1	8	1.05	\$1.31	\$0.63	\$0.00	(\$0.38)	\$3.26
23	Tier 2	12	1.27	\$1.31	\$0.91	\$0.00	(\$0.38)	\$5.86
24	Tier 3	16	1.55	\$1.31	\$1.28	\$0.00	\$0.00	\$6.61
25	Tier 4	>16	1.81	\$1.31	\$1.62	\$0.00	\$0.00	\$6.95
26	<b>Multi-family - Commercial</b>							
27	Tier 1	8	1.05	\$1.31	\$0.63	\$0.00	(\$0.38)	\$3.26
28	Tier 2	12	1.27	\$1.31	\$0.91	\$0.00	(\$0.38)	\$5.86
29	Tier 3	16	1.55	\$1.31	\$1.28	\$0.00	\$0.00	\$6.61
30	Tier 4	>16	1.81	\$1.31	\$1.62	\$0.00	\$0.00	\$6.95
31	<b>Commercial/AG</b>	<b>Uniform</b>	1.26	\$1.31	\$0.90	\$0.00	(\$0.25)	\$5.61
32	<b>Institutional</b>	<b>Uniform</b>	1.52	\$1.31	\$1.24	\$0.00	\$0.00	\$6.19
33	<b>Landscaping</b>	<b>Uniform</b>	1.55	\$1.31	\$1.28	\$0.18	\$0.00	\$6.49
34	<b>Construction</b>	<b>Uniform</b>	1.56	\$1.31	\$1.29	\$0.00	\$0.00	\$6.62

# 7. Recycled Water Rate Design

This section calculates recycled water rates based on the Cost of Service (Section 5). The rates developed in this section will be referred to as the Cost of Service recycled water rates.

## 7.1. Existing Rate Structure and Rates

Table 7-1 shows the current fixed and variable recycled water rates. The District charges recycled water customers on a monthly basis<sup>26</sup>. Fixed charges are anchored to the potable bi-monthly rate charged on a monthly basis. Current recycled commodity rates are based on an 80% price differential from potable commodity rates by customer class.

**Table 7-1: Current Recycled Water Rates**

Line No.	Description	Rates/Charges	
1	<b>Fixed Charge</b>		
2	<b>Meter Size</b>		
3	5/8"		\$22.58
4	3/4"		\$22.58
5	1"		\$33.25
6	1.5"		\$59.69
7	2"		\$91.53
8	3"		\$165.89
9	4"		\$272.31
10	6"		\$537.39
11	8"		\$855.87
12			
13	<b>Commodity Rate</b>	<b>Tier</b>	
14	Agriculture	Uniform	\$4.34
15	Commercial	Uniform	\$4.34
16	Public	Uniform	\$4.74
17	Government	Uniform	\$4.74
18	Landscaping	Uniform	\$5.00
19	Construction	Uniform	\$5.09

## 7.2. Recycled Water Rates

Rates developed in this section will recover the amount allocated to the Recycled Water cost component in Table 5-13. The District provides recycled water from San Elijo Reclamation facility. The distribution system is managed by the San Elijo Joint Power Authority (SEJPA). The District pays a uniform rate for SEJPA recycled water. The District does not own or maintain the recycled water system costs, however, it does bill customers.

The District sets recycled water fixed charges equal to the fixed charge for potable meters (Table 6-3). Table 7-2 shows the proposed fixed service charge and the total revenue collected from fixed charges.

<sup>26</sup> The difference in billing cycles make recycled water fixed charges appear to be half of the potable fixed charge.

**Table 7-2: Proposed Monthly Recycled Water Fixed Service Charge**

Line No.	Meter Size	Proposed Potable Bi-Monthly Service Charge	Proposed Monthly Service Charge	Number of Recycled Water Customers	Total Revenue from Fixed Charges
	(A)	(B)	(C)	(D)	(E)
1	5/8"	\$46.75	\$23.38	0	\$0
2	3/4"	\$46.75	\$23.38	1	\$281
3	1"	\$69.15	\$34.58	15	\$6,224
4	1.5"	\$124.65	\$62.33	10	\$7,479
5	2"	\$191.52	\$95.76	62	\$71,247
6	3"	\$347.66	\$173.83	7	\$14,602
7	4"	\$570.67	\$285.34	3	\$10,272
8	6"	\$1,127.69	\$563.85	0	\$0
9	8"	\$1,796.38	\$898.19	0	\$0
<b>10</b>	<b>Total</b>			<b>98</b>	<b>\$110,104</b>

Raftelis recommends the District charge its customers a uniform rate for recycled water since it is charged a uniform rate from SEJPA and moreover does not incur infrastructure costs to meet peaking demand. The current recycled water commodity rates provide an 80% discount from the potable commodity rates. Table 7-3 shows the derivation of the unit rate for all recycled water customers. Line 1 shows the total allocated costs to the Recycled Water utility (Table 5-13). Line 2 shows the total recycled water revenue collected from the fixed service charge (Table 7-2). Line 3 is the amount of revenue remaining to be collected from commodity rates, calculated by subtracting the fixed revenues from the allocated recycled water costs. Line 5 shows the estimated amount of recycled water use. Line 6 shows the recycled water commodity rate for all recycled water customers. The unit rate is calculated by dividing the recycled water costs (Line 3) by the total recycled water use (Line 5).

**Table 7-3: Derivation of Recycled Water Commodity Rate**

Line No.	Class/Tier	
1	Recycled Water Allocated Costs	\$838,520
2	Recycled Revenues from Fixed Charges	\$110,104
3	<b>Remaining Recycled Water Costs</b>	<b>\$728,416</b>
4		
5	Recycled Water Usage (HCF)	135,174
6	<b>Recycled Water Volumetric Rate</b>	<b>\$5.39</b>

# 8. Proposed Rates

This section shows the proposed rates for FY 2023 and FY 2024 by applying the revenue adjustments shown in Table 4-4 to rates derived for FY 2022 in Section 6 and Section 7. However, the rates for FY 2022 are set using the cost of service analysis and do not equate to increasing the current rates by the revenue adjustment for FY 2022 (5.5%). The cost of service analysis is detailed in Section 5.

## 8.1. Proposed Three-Year Rates

### 8.1.1. FIXED POTABLE BI-MONTHLY SERVICE CHARGES

Table 8-1 shows the proposed bi-monthly service charge. Table 8-2 shows the proposed fire service charges. The proposed fire service charges apply to all customers with private fire service connections. The rates for the current and proposed bi-monthly service charges and fire service charges are calculated based on the meter size and diameter of the fire line serving a property, respectively. The proposed rates are rounded to the cent.

**Table 8-1: Proposed Potable Bi-Monthly Service Charges**

Meter Size	FY 2021 Current	FY 2022 Proposed	FY 2023 Proposed	FY 2024 Proposed
5/8"	\$45.16	\$46.75	\$49.56	\$52.78
3/4"	\$45.16	\$46.75	\$49.56	\$52.78
1"	\$66.50	\$69.15	\$73.30	\$78.06
1.5"	\$119.37	\$124.65	\$132.13	\$140.72
2"	\$183.06	\$191.52	\$203.01	\$216.21
3"	\$331.78	\$347.66	\$368.52	\$392.47
4"	\$544.61	\$570.67	\$604.91	\$644.23
6"	\$1,074.78	\$1,127.69	\$1,195.35	\$1,273.05
8"	\$1,711.73	\$1,796.38	\$1,904.16	\$2,027.93

**Table 8-2: Proposed Fire Service Charges**

Meter Size/Line Diameter	FY 2021 Current	FY 2022 Proposed	FY 2023 Proposed	FY 2024 Proposed
1"	\$9.61	\$9.81	\$10.40	\$11.08
1.5"	\$10.83	\$8.74	\$9.26	\$9.86
2"	\$18.88	\$15.15	\$16.06	\$17.10
3"	\$47.77	\$38.15	\$40.44	\$43.07
4"	\$97.59	\$77.81	\$82.48	\$87.84
6"	\$276.40	\$220.17	\$233.38	\$248.55
8"	\$584.82	\$465.72	\$493.66	\$525.75

### 8.1.2. PROPOSED POTABLE COMMODITY RATES

Table 8-3 shows commodity rates for the next three years. Commodity rates are charged for each unit (HCF) of water. All rates are rounded to the cent.

**Table 8-3: Proposed Commodity Rates by Class/Tier**

Class/Tier	Tier Breakpoint	FY 2021	FY 2022	FY 2023	FY 2024
		Current	Proposed	Proposed	Proposed
<b>Single Family Residence</b>					
Tier 1	12	\$3.19	\$3.26	\$3.46	\$3.68
Tier 2	20	\$5.06	\$5.86	\$6.21	\$6.61
Tier 3	40	\$6.25	\$6.61	\$7.01	\$7.47
Tier 4	>40	\$7.12	\$7.86	\$8.33	\$8.87
<b>Single Family - Agriculture</b>					
Tier 1	12	\$3.19	\$3.26	\$3.46	\$3.68
Tier 2	20	\$5.06	\$5.86	\$6.21	\$6.61
Tier 3	40	\$6.25	\$6.61	\$7.01	\$7.47
Tier 4	>40	\$6.25	\$6.95	\$7.37	\$7.85
<b>Single Family - Commercial</b>					
Tier 1	12	\$3.19	\$3.26	\$3.46	\$3.68
Tier 2	20	\$5.06	\$5.86	\$6.21	\$6.61
Tier 3	40	\$6.25	\$6.61	\$7.01	\$7.47
Tier 4	>40	\$6.25	\$6.95	\$7.37	\$7.85
<b>Multi-family</b>					
Tier 1	8	\$3.19	\$3.26	\$3.46	\$3.68
Tier 2	12	\$5.06	\$5.86	\$6.21	\$6.61
Tier 3	16	\$6.25	\$6.61	\$7.01	\$7.47
Tier 4	>16	\$7.12	\$7.86	\$8.33	\$8.87
<b>Multi-family - Agriculture</b>					
Tier 1	8	\$3.19	\$3.26	\$3.46	\$3.68
Tier 2	12	\$5.06	\$5.86	\$6.21	\$6.61
Tier 3	16	\$6.25	\$6.61	\$7.01	\$7.47
Tier 4	>16	\$6.25	\$6.95	\$7.37	\$7.85
<b>Multi-family - Commercial</b>					
Tier 1	8	\$3.19	\$3.26	\$3.46	\$3.68
Tier 2	12	\$5.06	\$5.86	\$6.21	\$6.61
Tier 3	16	\$6.25	\$6.61	\$7.01	\$7.47
Tier 4	>16	\$6.25	\$6.95	\$7.37	\$7.85
<b>Commercial/AG</b>	Uniform	\$5.42	\$5.61	\$5.95	\$6.34
<b>Institutional</b>	Uniform	\$5.93	\$6.19	\$6.56	\$6.99
<b>Landscaping</b>	Uniform	\$6.25	\$6.49	\$6.88	\$7.33
<b>Construction</b>	Uniform	\$6.36	\$6.62	\$7.02	\$7.48

### 8.1.3. PROPOSED RECYCLED WATER RATES AND CHARGES

Table 8-4 shows recycled water charges rates for the next three years. Recycled water customers are billed monthly. The fixed charge is set to be half the potable bi-monthly fixed charge and based on the meter size serving the customer. Commodity rates are charged for each unit (HCF) of recycled. All rates are rounded to the cent.

**Table 8-4: Proposed Recycled Water Rates**

	FY 2021 Current	FY 2022 Proposed	FY 2023 Proposed	FY 2024 Proposed
<b>Fixed Meter Charges</b>				
<b>Meter Size</b>				
5/8"	\$22.58	\$23.38	\$24.78	\$26.39
3/4"	\$22.58	\$23.38	\$24.78	\$26.39
1"	\$33.25	\$34.58	\$36.65	\$39.03
1.5"	\$59.69	\$62.33	\$66.07	\$70.36
2"	\$91.53	\$95.76	\$101.51	\$108.11
3"	\$165.89	\$173.83	\$184.26	\$196.24
4"	\$272.31	\$285.34	\$302.46	\$322.12
6"	\$537.39	\$563.85	\$597.68	\$636.53
<b>Commodity Rates (\$/HCF)</b>				
<b>Customer Class</b>				
Agriculture	\$4.34	\$5.39	\$5.71	\$6.08
Commercial	\$4.34	\$5.39	\$5.71	\$6.08
Public	\$4.74	\$5.39	\$5.71	\$6.08
Government	\$4.74	\$5.39	\$5.71	\$6.08
Landscaping	\$5.00	\$5.39	\$5.71	\$6.08
Construction	\$5.09	\$5.39	\$5.71	\$6.08

# 9. Bill Impacts

This section discusses bill impacts for each potable water customer class. It is essential to understand how the proposed rates would impact the District’s customers. The customer impact analysis is a powerful tool to assist elected officials in making informed decisions. All customers will experience an increase in the fixed service charge. Note that customer bill impacts will vary with each customers’ meter size and commodity water use.

The monetary impact at various usage levels in sample customer bills below assume bi-monthly billing and compare bills under current rates/charges with proposed rates/charges effective January 1, 2022. Districts staff anticipate that SDCWA IAC pass-through charges for 2022 will not increase (Table 6-1).

## 9.1. Customer Bills Impacts

Table 9-1 shows the water bills for typical Single-Family Residential (SFR) customers with a ¾-inch meter for a bi-monthly billing period at various water consumption levels under current and proposed rates. The average and mode (most common) bi-monthly water usage for SFR customer class is 23 and 11 HCF, respectively.

**Table 9-1: Bill Impacts for Single Family Residence**

Line No.	Use (HCF)	Current Bi-Monthly Bill	Proposed Bi-Monthly Bill	Difference (\$)
1	12	\$91.92	\$94.35	\$2.43
2	24	\$157.40	\$167.67	\$10.27
3	32	\$207.40	\$220.55	\$13.15
4	40	\$257.40	\$273.43	\$16.03
5	48	\$314.36	\$336.31	\$21.95

Table 9-2 shows the water bills for typical Single-Family – Agricultural customers with a 1½ inch meter for a bi-monthly billing period at various water consumption levels under current and proposed rates. The average and mode (most common) bi-monthly water usage for the Single-Family - Agricultural customer class is 121 and 8 HCF, respectively.

**Table 9-2: Bill Impacts for Single Family - Agricultural**

Line No.	Use (HCF)	Current Bi-Monthly Bill	Proposed Bi-Monthly Bill	Difference (\$)
1	30	\$286.06	\$302.18	\$16.12
2	60	\$473.56	\$507.28	\$33.72
3	126	\$886.06	\$965.98	\$79.92
4	140	\$973.56	\$1,063.28	\$89.72
5	180	\$1,223.56	\$1,341.28	\$117.72

Table 9-3 shows the water bills for typical Single-Family - Commercial customers with a 1-inch meter for a bi-monthly billing period at various water consumption levels under current and proposed rates. The average and mode (most common) bi-monthly water usage for the Single-Family - Commercial customer class is 33 and 13 HCF, respectively.

**Table 9-3: Bill Impacts for Single Family - Commercial**

Line No.	Use (HCF)	Current Bi-Monthly Bill	Proposed Bi-Monthly Bill	Difference (\$)
1	10	\$111.97	\$115.32	\$3.35
2	20	\$158.83	\$168.72	\$9.89
3	34	\$246.33	\$261.26	\$14.93
4	40	\$283.83	\$300.92	\$17.09
5	50	\$346.33	\$370.42	\$24.09

Table 9-4 shows the water bills for typical Multi-Family Residential (MFR) customers with a ¾-inch meter for a bi-monthly billing period at various water consumption levels under current and proposed rates. The bill impacts assume a multi-family residence with two dwelling units. The average and mode (most common) bi-monthly water usage for the MFR customer class is 47 and 14 HCF, respectively.

**Table 9-4: Bill Impacts for Multi-Family Residence**

Line No.	Use (HCF)	Current Bi-Monthly Bill	Proposed Bi-Monthly Bill	Difference (\$)
1	26	\$157.66	\$167.49	\$9.83
2	40	\$252.12	\$270.03	\$17.91
3	50	\$323.32	\$348.63	\$25.31
4	80	\$536.92	\$584.43	\$47.51
5	100	\$679.32	\$741.63	\$62.31

Table 9-5 shows the water bills for typical Multi-Family – Agricultural customers with a 2-inch meter for a bi-monthly billing period at various water consumption levels under current and proposed rates. The bill impacts assume a multi-family residence with two dwelling units. The average and mode (most common) bi-monthly water usage for the Multi-Family – Agricultural customer class is 293 and 297 HCF, respectively.

**Table 9-5: Bill Impacts for Multi-Family - Agricultural**

Line No.	Use (HCF)	Current Bi-Monthly Bill	Proposed Bi-Monthly Bill	Difference (\$)
1	100	\$793.65	\$860.11	\$66.46
2	200	\$1,418.65	\$1,555.11	\$136.46
3	300	\$2,043.65	\$2,250.11	\$206.46
4	400	\$2,668.65	\$2,945.11	\$276.46
5	500	\$3,293.65	\$3,640.11	\$346.46

Table 9-6 shows the water bills for typical Single-Family Residential (SFR) customers with a 1-inch meter for a bi-monthly billing period at various water consumption levels under current and proposed rates. The bill impacts assume a multi-family residence with two dwelling units. The average and mode (most common) bi-monthly water usage for the Multi-Family – Commercial customer class is 41 and 11 HCF, respectively.

**Table 9-6: Bill Impacts for Multi-Family - Commercial**

Line No.	Use (HCF)	Current Bi-Monthly Bill	Proposed Bi-Monthly Bill	Difference (\$)
1	10	\$111.97	\$115.32	\$3.35
2	20	\$151.35	\$158.32	\$6.97
3	42	\$284.09	\$304.14	\$20.05
4	60	\$396.59	\$429.24	\$32.65
5	80	\$521.59	\$568.24	\$46.65

Table 9-7 shows the water bills for typical Agricultural/Commercial customers with a 5/8-inch meter<sup>27</sup> for a bi-monthly billing period at various water consumption levels under current and proposed rates. The average and mode (most common) bi-monthly water usage for the Agricultural/Commercial customer class is 86 and 7 HCF, respectively.

**Table 9-7: Bill Impacts for Agricultural/Commercial**

Line No.	Use (HCF)	Current Bi-Monthly Bill	Proposed Bi-Monthly Bill	Difference (\$)
1	40	\$270.44	\$279.63	\$9.19
2	80	\$487.24	\$504.03	\$16.79
3	120	\$704.04	\$728.43	\$24.39
4	160	\$920.84	\$952.83	\$31.99
5	200	\$1,137.64	\$1,177.23	\$39.59

Table 9-8 shows the water bills for typical Institutional customers with a 2-inch meter for a bi-monthly billing period at various water consumption levels under current and proposed rates. The average and mode (most common) bi-monthly water usage for the Institutional customer class is 84 and 1 HCF, respectively.

**Table 9-8: Bill Impacts for Institutional**

Line No.	Use (HCF)	Current Bi-Monthly Bill	Proposed Bi-Monthly Bill	Difference (\$)
1	20	\$345.73	\$359.39	\$13.66
2	60	\$582.93	\$606.99	\$24.06
3	88	\$748.97	\$780.31	\$31.34
4	100	\$820.13	\$854.59	\$34.46
5	200	\$1,413.13	\$1,473.59	\$60.46

<sup>27</sup> The average meter size for Agricultural customers is 2". Agricultural customers average water use is about 250 hcf.

Table 9-9 shows the water bills for typical Landscape customers with a 2-inch meter for a bi-monthly billing period at various water consumption levels under current and proposed rates. The average and mode (most common) bi-monthly water usage for the Landscape customer class is 105 and 1 HCF, respectively.

**Table 9-9: Bill Impacts for Landscape**

Line No.	Use (HCF)	Current Bi-Monthly Bill	Proposed Bi-Monthly Bill	Difference (\$)
1	26	\$389.63	\$404.33	\$14.70
2	50	\$539.63	\$560.09	\$20.46
3	110	\$914.63	\$949.49	\$34.86
4	160	\$1,227.13	\$1,273.99	\$46.86
5	300	\$2,102.13	\$2,182.59	\$80.46

Table 9-10 shows the water bills for typical construction customers with a ¾-inch meter for a bi-monthly billing period at various water consumption levels under current and proposed rates. The average bi-monthly water usage for the Institutional customer class is 10 HCF.

**Table 9-10: Bill Impacts for Construction**

Line No.	Use (HCF)	Current Bi-Monthly Bill	Proposed Bi-Monthly Bill	Difference (\$)
1	4	\$79.08	\$81.71	\$2.63
2	6	\$91.80	\$94.95	\$3.15
3	10	\$117.24	\$121.43	\$4.19
4	16	\$155.40	\$161.15	\$5.75
5	28	\$231.72	\$240.59	\$8.87

# 10. Drought Rates

## 10.1. Drought Rate Background

This section documents the development of Drought Rates to be implemented only during a declared water supply shortage response. This section provides an overview of the water shortage emergency stages, corresponding revenue impacts, drought rate calculations, and a summary of proposed consumption charges at each stage effective January 1, 2022, January 1, 2023, and January 1, 2024. The drought rates calculated in this section are separate charges independent from the water rates derived in Section 7.

The District would like to update the drought rates using the existing methodology. Under District direction, Raftelis updated the drought rates to be assessed per unit (HCF) of water. The percent reduction in water demand during each water shortage emergency stage is defined in the District's Water Shortage Contingency Plan, approved by the Board as a part of the 2020 Urban Water Management Plan and Municipal Code. The District can establish drought rates to:

- Recover lost revenue due to decreased consumption during a drought; and
- Encourage water conservation to meet the desired conservation goals for each drought stage.

The District is subject to penalties from the SDCWA should it exceed its water allocation. Also, the District may be subject to penalties from the State Water Resources Control Board if it does not reach future mandated water use reductions. Drought Rates help maximize the probability that the District will escape penalties. Drought Rates will still be needed to recoup lost revenues as District customers curtail their water consumption.

### Revenue Collection during a Drought

Water shortage emergencies can have significant impacts on an agency's financial stability. During a drought, the District's revenue requirement (costs) decreases along with revenue. However, the District's revenue decreases more than its costs do. The majority of the District's costs are fixed (salaries, benefits, debt service, etc.) Drought Rates are required to recover lost revenue to cover its fixed costs. Raftelis recommends that the District utilize Drought Rates as part of a cohesive and fiscally sound response to water shortage emergencies. Drought rates are a mechanism to maintain revenue stability and achieve debt coverage requirements during a water shortage emergency.

### Customer Bills during a Drought

Provided that customers cut back their water use in line with the drought cutback goal, their total water bill should be equal to or lower than their bill during "normal" water/rainfall years. Conversely, those that do not cut back consumption will face higher charges.

## 10.2. Derivations of Drought Rates

Drought rates recover the projected decrease in net revenues experienced during each water shortage emergency stage. To calculate drought rates, Raftelis adhered to the following steps:

1. Determine the lost revenue at each stage of reduction.
2. Account for variable water supply cost savings to offset a portion of the revenue loss.
3. Divide the net revenue loss at each stage by the respective estimated sales volume.

Table 10-1 shows the assumed reduction in water sales by customer class and tier at each drought stage.

**Table 10-1: Estimated Cutback in Use by Percentage Reduction**

Line No.	Customer Class	Bi-monthly Tier Breakpoint	FY 2022 Estimated Water Use (HCF)	Up to 10%		Up to 20%		Up to 30%		Up to 40%		Up to 50%		Up to 60%	
				Estimated Cutback (%)	Estimated Cutback (HCF)										
1	<b>Single Family Residence</b>		<b>1,310,025</b>												
2	Tier 1	12	586,031	0%	0	0%	0	0%	0	5%	29,302	20%	117,206	25%	146,508
3	Tier 2	20	249,915	5%	12,496	10%	24,992	20%	49,983	35%	87,470	45%	112,462	80%	199,932
4	Tier 3	40	297,716	20%	59,543	35%	104,201	50%	148,858	66%	196,493	85%	253,059	95%	282,830
5	Tier 4	>40	176,362	25%	44,091	52%	91,708	85%	149,908	95%	167,544	100%	176,362	100%	176,362
6	<b>Single Family - Agriculture</b>		<b>16,726</b>												
7	Tier 1	12	1,977	0%	0	0%	0	0%	0	5%	99	20%	395	25%	494
8	Tier 2	20	1,187	5%	59	10%	119	20%	237	35%	416	45%	534	80%	950
9	Tier 3	40	2,620	20%	524	35%	917	50%	1,310	66%	1,729	85%	2,227	95%	2,489
10	Tier 4	>40	10,942	25%	2,735	52%	5,690	85%	9,300	95%	10,395	100%	10,942	100%	10,942
11	<b>Single Family - Commercial</b>		<b>1,807</b>												
12	Tier 1	12	738	0%	0	0%	0	0%	0	5%	37	20%	148	25%	184
13	Tier 2	20	306	5%	15	10%	31	20%	61	35%	107	45%	138	80%	245
14	Tier 3	40	324	20%	65	35%	114	50%	162	66%	214	85%	276	95%	308
15	Tier 4	>40	439	25%	110	52%	228	85%	373	95%	417	100%	439	100%	439
16	<b>Multi-family</b>		<b>482,126</b>												
17	Tier 1	8	315,788	0%	0	0%	0	0%	0	5%	15,789	20%	63,158	25%	78,947
18	Tier 2	12	72,261	5%	3,613	10%	7,226	20%	14,452	35%	25,291	45%	32,518	80%	57,809
19	Tier 3	16	39,987	20%	7,997	35%	13,995	50%	19,994	66%	26,391	85%	33,989	95%	37,988
20	Tier 4	>16	54,089	25%	13,522	52%	28,126	85%	45,976	95%	51,385	100%	54,089	100%	54,089
21	<b>Multi-family - Agriculture</b>		<b>8,799</b>												
22	Tier 1	8	498	0%	0	0%	0	0%	0	5%	25	20%	100	25%	124
23	Tier 2	12	249	5%	12	10%	25	20%	50	35%	87	45%	112	80%	199
24	Tier 3	16	233	20%	47	35%	81	50%	116	66%	154	85%	198	95%	221
25	Tier 4	>16	7,820	25%	1,955	52%	4,066	85%	6,647	95%	7,429	100%	7,820	100%	7,820
26	<b>Multi-family - Commercial</b>		<b>1,221</b>												
27	Tier 1	8	372	0%	0	0%	0	0%	0	5%	19	20%	74	25%	93
28	Tier 2	12	97	5%	5	10%	10	20%	19	35%	34	45%	44	80%	78
29	Tier 3	16	73	20%	15	35%	26	50%	37	66%	48	85%	62	95%	70
30	Tier 4	>16	678	25%	170	52%	353	85%	577	95%	644	100%	678	100%	678
31	<b>Ag/Commercial</b>		<b>306,515</b>	<b>10%</b>	<b>30,651</b>	<b>25%</b>	<b>76,629</b>	<b>30%</b>	<b>91,954</b>	<b>40%</b>	<b>122,606</b>	<b>40%</b>	<b>122,606</b>	<b>50%</b>	<b>153,257</b>
32	<b>Institutional</b>		<b>54,769</b>	<b>25%</b>	<b>13,692</b>	<b>40%</b>	<b>21,908</b>	<b>50%</b>	<b>27,385</b>	<b>60%</b>	<b>32,861</b>	<b>60%</b>	<b>32,861</b>	<b>65%</b>	<b>35,600</b>
33	<b>Landscaping</b>		<b>147,719</b>	<b>30%</b>	<b>44,316</b>	<b>60%</b>	<b>88,631</b>	<b>90%</b>	<b>132,947</b>	<b>95%</b>	<b>140,333</b>	<b>95%</b>	<b>140,333</b>	<b>100%</b>	<b>147,719</b>
34	<b>Construction</b>		<b>17,597</b>	<b>0%</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>100%</b>	<b>17,597</b>	<b>100%</b>	<b>17,597</b>	<b>100%</b>	<b>17,597</b>
35	<b>Total Cutback - HCF</b>		<b>2,347,303</b>		<b>235,633</b>		<b>469,074</b>		<b>700,346</b>		<b>934,915</b>		<b>1,180,425</b>		<b>1,413,972</b>
36	<b>Total Cutback - %</b>				<b>10.0%</b>		<b>20.0%</b>		<b>29.8%</b>		<b>39.8%</b>		<b>50.3%</b>		<b>60.2%</b>

Table 10-2 shows the total consumption charge revenue at each stage, calculated by multiplying projected water sales (Table 10-1) by the proposed consumption charge (Table 8-3). The total estimated lost revenue is shown in line 35.

**Table 10-2: Calculation of Lost Revenue**

Line No.	Customer Class	Declared Water Supply FY 2022 Proposed Rate	1	2	3	4	5	6
			Up to 10%	Up to 20%	Up to 30%	Up to 40%	Up to 50%	Up to 60%
<b>1</b>	<b>Single Family Residence</b>							
2	Tier 1	\$3.26	\$0	\$0	\$0	\$95,523	\$382,092	\$477,615
3	Tier 2	\$5.86	\$73,225	\$146,450	\$292,901	\$512,576	\$659,027	\$1,171,603
4	Tier 3	\$6.61	\$393,581	\$688,766	\$983,952	\$1,298,817	\$1,672,718	\$1,869,509
5	Tier 4	\$7.86	\$346,551	\$720,827	\$1,178,275	\$1,316,895	\$1,386,206	\$1,386,206
<b>6</b>	<b>Single Family - Agriculture</b>							
7	Tier 1	\$3.26	\$0	\$0	\$0	\$322	\$1,289	\$1,611
8	Tier 2	\$5.86	\$348	\$696	\$1,392	\$2,435	\$3,131	\$5,567
9	Tier 3	\$6.61	\$3,463	\$6,060	\$8,658	\$11,428	\$14,718	\$16,450
10	Tier 4	\$6.95	\$19,011	\$39,543	\$64,637	\$72,242	\$76,044	\$76,044
<b>11</b>	<b>Single Family - Commercial</b>							
12	Tier 1	\$3.26	\$0	\$0	\$0	\$120	\$481	\$601
13	Tier 2	\$5.86	\$90	\$179	\$359	\$628	\$807	\$1,435
14	Tier 3	\$6.61	\$429	\$750	\$1,072	\$1,415	\$1,823	\$2,037
15	Tier 4	\$6.95	\$762	\$1,585	\$2,591	\$2,896	\$3,049	\$3,049
<b>16</b>	<b>Multi-family</b>							
17	Tier 1	\$3.26	\$0	\$0	\$0	\$51,474	\$205,894	\$257,368
18	Tier 2	\$5.86	\$21,173	\$42,345	\$84,690	\$148,208	\$190,553	\$338,760
19	Tier 3	\$6.61	\$52,863	\$92,510	\$132,157	\$174,447	\$224,667	\$251,098
20	Tier 4	\$7.86	\$106,285	\$221,074	\$361,370	\$403,885	\$425,142	\$425,142
<b>21</b>	<b>Multi-family - Agriculture</b>							
22	Tier 1	\$3.26	\$0	\$0	\$0	\$81	\$325	\$406
23	Tier 2	\$5.86	\$73	\$146	\$292	\$511	\$656	\$1,167
24	Tier 3	\$6.61	\$307	\$538	\$769	\$1,015	\$1,307	\$1,461
25	Tier 4	\$6.95	\$13,587	\$28,262	\$46,197	\$51,632	\$54,350	\$54,350
<b>26</b>	<b>Multi-family - Commercial</b>							
27	Tier 1	\$3.26	\$0	\$0	\$0	\$61	\$243	\$303
28	Tier 2	\$5.86	\$28	\$57	\$114	\$199	\$256	\$454
29	Tier 3	\$6.61	\$97	\$170	\$243	\$320	\$413	\$461
30	Tier 4	\$6.95	\$1,179	\$2,452	\$4,007	\$4,479	\$4,715	\$4,715
31	<b>Ag/Commercial</b>	\$5.61	\$171,955	\$429,887	\$515,864	\$687,819	\$687,819	\$859,774
32	<b>Institutional</b>	\$6.19	\$84,755	\$135,608	\$169,511	\$203,413	\$203,413	\$220,364
33	<b>Landscaping</b>	\$6.49	\$287,608	\$575,216	\$862,825	\$910,759	\$910,759	\$958,694
34	<b>Construction</b>	\$6.62	\$0	\$0	\$0	\$116,490	\$116,490	\$116,490
<b>35</b>	<b>Total Lost Revenue</b>		<b>\$1,577,371</b>	<b>\$3,133,122</b>	<b>\$4,711,875</b>	<b>\$6,070,090</b>	<b>\$7,228,384</b>	<b>\$8,502,732</b>
36	<b>Non-Drought Commodity Revenue</b>		<b>\$12,187,309</b>	<b>\$12,187,309</b>	<b>\$12,187,309</b>	<b>\$12,187,309</b>	<b>\$12,187,309</b>	<b>\$12,187,309</b>
37	<b>Percent of Commodity Revenue Lost</b>		<b>13%</b>	<b>26%</b>	<b>39%</b>	<b>50%</b>	<b>59%</b>	<b>70%</b>

As water sales decrease by stage, the District’s variable water supply costs will also decrease. Table 10-3 shows the reduction in water purchase costs as water demand is reduced at each stage. The assumed curtailment in water use was determined previously in Table 10-1. Water supply availability and variable unit costs are outlined in Table 6-8. Projected water purchase costs are determined by multiplying the unit rate for each supply source by the corresponding acre-feet supplied for each stage. The total amount saved due to decreased water purchase costs is shown in line 7.

**Table 10-3: Drought Savings**

Declared Water Supply Shortage Response			1	2	3	4	5	6
Line No.	Description	FY 2022	Up to 10%	Up to 20%	Up to 30%	Up to 40%	Up to 50%	Up to 60%
1	<b>Water Supply Costs</b>	\$4,183,671						
2	<b>Treatment Costs</b>	\$2,966,311						
3	<b>Subtotal Variable Costs</b>	<b>\$7,149,983</b>						
4	<b>Cutback (%)</b>		<b>10%</b>	<b>20%</b>	<b>29.8%</b>	<b>39.8%</b>	<b>50%</b>	<b>60%</b>
5	<b>Total Drought Savings</b>		<b>\$717,749</b>	<b>\$1,428,820</b>	<b>\$2,133,284</b>	<b>\$2,847,791</b>	<b>\$3,595,624</b>	<b>\$4,307,018</b>
6								
7	<b>Drought Volumetric Revenue Requirement - All Classes</b>		<b>\$11,469,560</b>	<b>\$10,758,489</b>	<b>\$10,054,025</b>	<b>\$9,339,518</b>	<b>\$8,591,684</b>	<b>\$7,880,291</b>

Table 10-4 shows the derivation of the proposed drought rates. Net revenue loss (Line 3) in each stage is determined by subtracting the projected water purchase cost savings (from Table 10-3) from the projected lost revenue (Table 10-2). The percentage increase required to collect lost revenues is determined by dividing the net revenue loss at each stage by the corresponding projected water sales in HCF (Table 8-1). Drought rates recover the anticipated reduction in net revenues during each water shortage emergency stage by applying the percentage increase (Line 6) to commodity rates to recoup the lost revenue. The percentage increase needed for each drought stage is calculated by dividing the net lost revenue (Line 3) by the expected drought revenue (Line 4). This percentage increase is applied to the proposed commodity (Table 8-3) rates to yield the drought rates. Lines 8 – 41 show the dollar increase for each drought stage, assuming the proposed FY 2022 rates.

Table 10-4: FY 2022 of Drought Rate Calculation

Line No.	Declared Water Supply Shortage Response	FY 2022													
		1 Up to 10%		2 Up to 20%		3 Up to 30%		4 Up to 40%		5 Up to 50%		6 Up to 60%			
1	Estimated Lost Revenue	\$1,577,371		\$3,133,122		\$4,711,875		\$6,070,090		\$7,228,384		\$8,502,732			
2	Estimated Drought Savings	\$717,749		\$1,428,820		\$2,133,284		\$2,847,791		\$3,595,624		\$4,307,018			
3	Estimated Lost Revenue After Savings	\$859,622		\$1,704,302		\$2,578,591		\$3,222,299		\$3,632,760		\$4,195,714			
4	Expected Revenue	\$10,609,938		\$9,054,186		\$7,475,434		\$6,117,219		\$4,958,924		\$3,684,577			
5	Drought Revenue Requirement	\$11,469,560		\$10,758,489		\$10,054,025		\$9,339,518		\$8,591,684		\$7,880,291			
6	<b>% Increase</b>	<b>8%</b>		<b>19%</b>		<b>34%</b>		<b>53%</b>		<b>73%</b>		<b>114%</b>			
7	<b>Customer Class</b>	<b>Rate (No Drought)</b>	<b>Drought Rate</b>	<b>\$ Increase</b>											
8	<b>Single Family Residence</b>														
9	Tier 1	\$3.26	\$3.52	\$0.26	\$3.87	\$0.61	\$4.38	\$1.12	\$4.98	\$1.72	\$5.65	\$2.39	\$6.97	\$3.71	
10	Tier 2	\$5.86	\$6.33	\$0.47	\$6.96	\$1.10	\$7.88	\$2.02	\$8.95	\$3.09	\$10.15	\$4.29	\$12.53	\$6.67	
11	Tier 3	\$6.61	\$7.15	\$0.54	\$7.85	\$1.24	\$8.89	\$2.28	\$10.09	\$3.48	\$11.45	\$4.84	\$14.14	\$7.53	
12	Tier 4	\$7.86	\$8.50	\$0.64	\$9.34	\$1.48	\$10.57	\$2.71	\$12.00	\$4.14	\$13.62	\$5.76	\$16.81	\$8.95	
13	<b>Single Family - Agriculture</b>														
14	Tier 1	\$3.26	\$3.52	\$0.26	\$3.87	\$0.61	\$4.38	\$1.12	\$4.98	\$1.72	\$5.65	\$2.39	\$6.97	\$3.71	
15	Tier 2	\$5.86	\$6.33	\$0.47	\$6.96	\$1.10	\$7.88	\$2.02	\$8.95	\$3.09	\$10.15	\$4.29	\$12.53	\$6.67	
16	Tier 3	\$6.61	\$7.15	\$0.54	\$7.85	\$1.24	\$8.89	\$2.28	\$10.09	\$3.48	\$11.45	\$4.84	\$14.14	\$7.53	
17	Tier 4	\$6.95	\$7.51	\$0.56	\$8.26	\$1.31	\$9.35	\$2.40	\$10.61	\$3.66	\$12.04	\$5.09	\$14.86	\$7.91	
18	<b>Single Family - Commercial</b>														
19	Tier 1	\$3.26	\$3.52	\$0.26	\$3.87	\$0.61	\$4.38	\$1.12	\$4.98	\$1.72	\$5.65	\$2.39	\$6.97	\$3.71	
20	Tier 2	\$5.86	\$6.33	\$0.47	\$6.96	\$1.10	\$7.88	\$2.02	\$8.95	\$3.09	\$10.15	\$4.29	\$12.53	\$6.67	
21	Tier 3	\$6.61	\$7.15	\$0.54	\$7.85	\$1.24	\$8.89	\$2.28	\$10.09	\$3.48	\$11.45	\$4.84	\$14.14	\$7.53	
22	Tier 4	\$6.95	\$7.51	\$0.56	\$8.26	\$1.31	\$9.35	\$2.40	\$10.61	\$3.66	\$12.04	\$5.09	\$14.86	\$7.91	
23	<b>Multi-family</b>														
24	Tier 1	\$3.26	\$3.52	\$0.26	\$3.87	\$0.61	\$4.38	\$1.12	\$4.98	\$1.72	\$5.65	\$2.39	\$6.97	\$3.71	
25	Tier 2	\$5.86	\$6.33	\$0.47	\$6.96	\$1.10	\$7.88	\$2.02	\$8.95	\$3.09	\$10.15	\$4.29	\$12.53	\$6.67	
26	Tier 3	\$6.61	\$7.15	\$0.54	\$7.85	\$1.24	\$8.89	\$2.28	\$10.09	\$3.48	\$11.45	\$4.84	\$14.14	\$7.53	
27	Tier 4	\$7.86	\$8.50	\$0.64	\$9.34	\$1.48	\$10.57	\$2.71	\$12.00	\$4.14	\$13.62	\$5.76	\$16.81	\$8.95	
28	<b>Multi-family - Agriculture</b>														
29	Tier 1	\$3.26	\$3.52	\$0.26	\$3.87	\$0.61	\$4.38	\$1.12	\$4.98	\$1.72	\$5.65	\$2.39	\$6.97	\$3.71	
30	Tier 2	\$5.86	\$6.33	\$0.47	\$6.96	\$1.10	\$7.88	\$2.02	\$8.95	\$3.09	\$10.15	\$4.29	\$12.53	\$6.67	
31	Tier 3	\$6.61	\$7.15	\$0.54	\$7.85	\$1.24	\$8.89	\$2.28	\$10.09	\$3.48	\$11.45	\$4.84	\$14.14	\$7.53	
32	Tier 4	\$6.95	\$7.51	\$0.56	\$8.26	\$1.31	\$9.35	\$2.40	\$10.61	\$3.66	\$12.04	\$5.09	\$14.86	\$7.91	
33	<b>Multi-family - Commercial</b>														
34	Tier 1	\$3.26	\$3.52	\$0.26	\$3.87	\$0.61	\$4.38	\$1.12	\$4.98	\$1.72	\$5.65	\$2.39	\$6.97	\$3.71	
35	Tier 2	\$5.86	\$6.33	\$0.47	\$6.96	\$1.10	\$7.88	\$2.02	\$8.95	\$3.09	\$10.15	\$4.29	\$12.53	\$6.67	
36	Tier 3	\$6.61	\$7.15	\$0.54	\$7.85	\$1.24	\$8.89	\$2.28	\$10.09	\$3.48	\$11.45	\$4.84	\$14.14	\$7.53	
37	Tier 4	\$6.95	\$7.51	\$0.56	\$8.26	\$1.31	\$9.35	\$2.40	\$10.61	\$3.66	\$12.04	\$5.09	\$14.86	\$7.91	
38	<b>Ag/Commercial</b>	\$5.61	\$6.06	\$0.45	\$6.67	\$1.06	\$7.55	\$1.94	\$8.57	\$2.96	\$9.72	\$4.11	\$12.00	\$6.39	
39	<b>Institutional</b>	\$6.19	\$6.69	\$0.50	\$7.36	\$1.17	\$8.33	\$2.14	\$9.45	\$3.26	\$10.72	\$4.53	\$13.24	\$7.05	
40	<b>Landscaping</b>	\$6.49	\$7.02	\$0.53	\$7.71	\$1.22	\$8.73	\$2.24	\$9.91	\$3.42	\$11.24	\$4.75	\$13.88	\$7.39	
41	<b>Construction</b>	\$6.62	\$7.16	\$0.54	\$7.87	\$1.25	\$8.90	\$2.28	\$10.11	\$3.49	\$11.47	\$4.85	\$14.16	\$7.54	

### 10.2.1. DROUGHT RATE ADOPTION

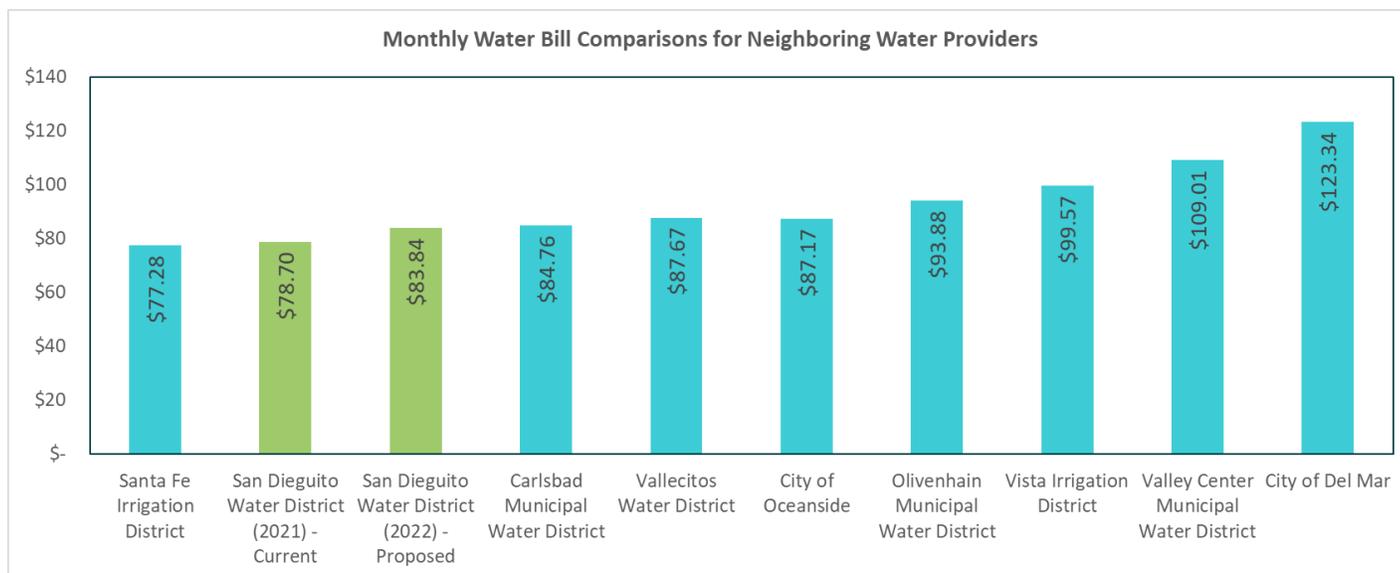
The Board would adopt the drought rates separately from any other type of rate increase. For the duration of the rate proposal period (3 years), the Board would have the ability to adopt drought rates by increasing the then-current commodity rate without having to re-issue the Proposition 218 notice.

# 11. Water Rate Survey

Raftelis conducted a rate survey to benchmark current and proposed water rates against eight neighboring water providers. While a useful benchmark, it is worth noting that such comparisons only paint a partial picture since many factors, such as water sources, age and replacement of infrastructure, service area characteristics, revenue sources, and other local conditions, affect the total cost of providing water services.

Figure 11-1 shows a monthly<sup>28</sup> water bill comparison for the current (2021) and proposed (2022) rates against eight neighboring agencies. The survey assumes a single-family residential customer using 12 HCF of water per month, with a 3/4” metered connection. This survey was conducted in March 2021 and should only be used as a reference point or snapshot in time.

**Figure 11-1: Monthly Bill Comparisons for Neighboring Agencies**



<sup>28</sup> Agencies with a bi-monthly billing cycle are adjusted to a monthly billing cycle by dividing fixed charges and tier widths in half.